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**DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF A PROGRAMME TO
FACILITATE CRITICAL THINKING IN NURSING EDUCATION**

by

AGNES MAKHENE

THESIS

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Promoter: Prof MM Chabeli

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DEDICATION

This study is dedicated to my mother Mamapedi Makhene

My husband Bafana

And

My daughters Refilwe and Kensani



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I wish to extend my heartfelt gratitude and sincerest appreciation to:

The Lord Almighty, for despite my ill health, gave me strength, wisdom, perseverance, a listening heart and courage to pursue the study to its conclusion.

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My spiritual brothers and sisters for covering me with prayer.

EXECUTIVE SUMMARY

The purpose of the study is to describe the development, implementation and evaluation of a programme to facilitate critical thinking in nursing education. The researcher departed deductively from the recommendation of a Delphi study by exponents of critical thinking that researchers are to develop programmes and assessment tools of critical thinking. They came up with a consensus definition resulting from a concept analysis and defined critical thinking as a purposeful, self-regulatory judgement which results into interpretation, analysis, evaluation and inference including explanation of the critical thinking process of contextual, conceptual, methodological, evidential and criteriological considerations on which the judgment is based. The researcher made use of the critical thinking framework that included contextual, conceptual, methodological, evidential and criteriological dimensions of critical thinking to develop a conceptual framework to facilitate critical thinking. The study is a qualitative, explorative and descriptive design for programme development that is contextual in nature.

The study was conducted in four phases. Ethical consideration were maintained throughout the study. Phase one of the study is the empirical phase which included focus group interviews and follow up individual interviews of a purposively selected sample of nurse educators on how to facilitate critical thinking using the critical thinking framework. Huberman's conception matrices method of data analysis was used to analyse the empirical data.

Lincoln and Guba's framework for trustworthiness was used to ensure trustworthiness. Phase two dealt with the conceptualisation of the findings from participants using Dickoff, James and Wiedenbach's six elements of practice theory. Phase three involved the use of an integrated curriculum framework derived from Beyer, Bevis and Caffarella to develop the programme to facilitate critical thinking. The components of the integrated framework include **(1)** The context within which critical thinking is to be facilitated. **(2)** The philosophical foundation that gives direction to the programme. **(3)** Programme learning outcomes. **(4)** The identified methods of teaching and assessment to facilitate critical thinking were: reflection; Socratic questioning, argumentation, dialectic dialogic reasoning and cooperative/collaborative learning. **(5)** Programme outcomes. Phase four of the study was the implementation and evaluation of the programme.

The programme was implemented in a first year class of learners in the BCur programme at an institution of higher education. The learners also evaluated the programme post the implementation and provided qualitative data for evaluation. Original contribution, justification, limitations, recommendations and conclusions were also described in this phase.



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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 BACKGROUND AND RATIONALE

Critical thinking is a buzzword in nursing education. There is a need to design educational programmes aimed at developing competent personnel who are critical thinkers (White Paper for the Transformation of the Health System in South Africa, 1997). This is necessitated by increasingly complex health care demands by consumers of health care. The dynamic nature of health care and the ever increasing demand on nurses to make decisions about patient/client care makes this need even more urgent. There is a global call for universal practitioners with critical thinking skills, which skills will enable practitioners to offer appropriate care. The focus is moving away from education for employment to education for employability, the intention being to develop the ability to adapt acquired skills to practice. This brings about the need for educational institutions to produce practitioners who have the ability to identify and solve problems, and to make decisions displaying the use of critical thinking and creative thinking, among other critical outcomes (South African Qualifications Authority, Act 58 of 1995).

Butlerman-Bos (2008: 412-420) is of the opinion that it is important to impart with content that is relevant for practice, and that conscientious teachers should expend a great amount of effort designing learning activities that encourage and assess students' thinking. However, it is not enough to concentrate on imparting the content only. This is because of the fluid nature of health care systems and the nature of the health care demands of communities. The complexity of the current clinical situation contradicts the linear knowledge application model that this approach assumes. Practitioners are required to think more laterally and be open-minded. It is the responsibility of nurse educators to design programmes that will ensure that today's learners will contribute to health care and thrive as practitioners in tomorrow's radically different and ever-changing health care environment, in order to meet South Africa's evolving health care needs (Heywood, 2009: 925-936).

Critical thinking is understood to be purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations on which judgment is based (Facione, 1990: 2). According to Facione (1990: 2), critical thinking is a liberating force in education and a powerful resource in one's personal and civic life. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused on inquiry, and persistent in seeking results that are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working towards this ideal (Facione, 1990: 2).

Critical thinking is directed towards non-routine thinking, which is thinking that cannot be adequately based on algorithms or other mechanical procedures. It is called for in situations in which considerations must be weighed and alternatives assessed; situations that call for an assessment of priorities and a determination of truth and relevance (Wynn & Williams, 2012: 787-810). The critical thinker will display a spirit of probing inquisitiveness, a keenness of mind, a zealous dedication to reason, and a hunger or eagerness for reliable information, which good critical thinkers possess, but weak critical thinkers do not have (Facione, 1990: 11).

Therefore, it is imperative that educational programmes should focus on producing critical thinkers as the ultimate goal. Nursing education programmes should concentrate on the development of both the cognitive skills and the affective dispositions of critical thinking. Many faculties have cited their educational goal as being the development of critical thinking among learners, but this ideal has constantly eluded nurse educators. This is confirmed by Banning (2008: 177-183) who explains that the mistake that nurse educators have made, and continue to make, is to try to use one paradigm to answer all their needs. Behaviour modification has worked on children, but it has failed to allow for connected learning and constructed knowledge, for emancipatory education, for critical thinking, and for participatory power structures (Banning, 2008: 177-183).

Many nurse educators have taught critical thinking in a disjointed manner, meaning that this skill was taught and evaluated in isolation. According to Kaddoura (2010: 506-516), critical thinking includes both cognitive and affective qualities, and therefore both the cognitive and the affective domains must be addressed when identifying the expectations of graduates, curriculum and course objectives, teaching and development activities, and stated outcomes and the measurement of those outcomes. This is affirmed by Facione (1990: 5), who, after an extensive concept analysis of critical thinking, found that although the identification and analysis of critical thinking skills transcends specific subjects or disciplines in significant ways, learning and applying these skills in many contexts requires domain-specific knowledge.

This domain-specific knowledge includes methodological principles and competence to engage in norm-regulated practices that are at the core of reasonable judgment in specific contexts. In a programme designed by Guiller, Durndell and Ross (2008: 187-200), critical thinking was seen as a holistic process that involves creativity, inquiry, sorting and organising data, recognising patterns, assembling evidence, and analysing conclusions from a variety of perspectives before decision-making is conducted. However, Yang, Richardson, French and Lehman (2011: 43-70) did not clearly distinguish the different subcategories of cognitive skills, and the affective dispositions are also not explained. Related to these cognitive skills are affective dispositions, as cited by Facione (1990: 11). The programme's focus is on creativity.

Conversely, Duchscher (2008: 441-450) interactively reviewed stages of new nursing graduates' professional role transition and their critical thinking skills. The review indicated that even though critical thinking was supposedly taught and evaluated, there were clear differences of opinion on what critical thinking is. As a result, there was no comprehensive facilitation of the cognitive skills and affective dispositions, as cited by the panel of experts in Facione (1990: 11). Employers throughout the world require a practitioner who has critical thinking skills. This is even more the case in the nursing profession, where nurse practitioners are faced with the challenge of an ever-changing health arena, with client demands becoming more complex by the day. These complexities require a critical thinker who will apply his/her mind critically to the issues at hand in order to produce solutions.

Tanner (2006: 204-211) noted that it is apparent that nurses now need an even stronger educational base from which to explore and respond to the complex world of health care delivery appropriately. The concern is that employers' demands are that graduates be flexible, adaptable, independent, reflective, curious, imaginative, and have well-developed problem-solving abilities and critical thinking skills. These concerns reflect a perceived need for a curriculum that is intentionally constructed around carefully articulated programme goals that both guide assessment strategies and continuously inform educators about their learners' outcomes (Smedley, 2007: 373-385). Brandon and All (2010: 89-92) suggested the use of constructivism as a point of departure in education for critical thinking. Constructivism holds that 'knowledge' is individually constructed and socially co-constructed by learners, based on their interpretation of experiences in the world. Constructivism makes the learner the centre of attention, with the instructor being relegated to the role of arranging suitable conditions for learning.

In educational environments where the educational approach is learner-centred, where the learner takes a leading role in the teaching-learning process, with interactive collaboration between the learner and the teacher, development of critical thinking is enhanced. Mangena and Chabeli (2005: 291-298) concurred that learner-centred teaching styles foster independent learning, creative problem solving skills, a commitment to lifelong learning, and critical thinking. Therefore, there is a need to move from teacher-centred teaching/learning approaches to learner-centred approaches, where the learner is in full control of the teaching/learning process. Critical thinking can occur in programmes that are rich in discipline-specific content, or in programmes that rely on events in everyday life as the basis for developing one's critical thinking (Facione, 1990: 4).

Therefore, it is evident that critical thinking should be infused into educational programmes as the core outcome of such programmes. However, it is evident that despite several critical thinking programmes having been developed in the nursing education system, these programmes do not address all the attributes of critical thinking. For example, in an attempt to infuse critical thinking in the baccalaureate programme, Worrell and Profetto-McGrath (2007: 420-426) suggest that a clinical programme should include activities that would be given to the learners with the aim of developing critical thinking.

However, based on their definition of critical thinking, none of the cognitive skills and affective dispositions of critical thinking are addressed. The programme does not give a clear direction of what attributes to look for in order to ascertain that students' critical thought is facilitated.

On the other hand, in a programme developed by Zygmunt and Schaefer (2006: 260-268) asserted the importance of focusing on cognitive skills that should be included in baccalaureate programme to facilitate critical thinking skills of learners. Despite having elucidated the definition of critical thinking, as given by the panel of experts in Facione (1990: 2-11), the competencies or skills cited in their study are those that are consistent with the problem-solving process, and seven affective dispositions are included in the programme. Williams (2005: 163-187) concentrated on critical dimensions, as described by Suliman and Halabi (2007: 162-168) which are elements, abilities, and traits of reasoning that confounded their arguments, to the exclusion of a wider range of cognitive skills and affective dispositions of critical thinking, as cited by critical thinking exponents in Facione (1990: 2-11). Therefore, it is the researcher's belief that a programme that is inclusive of all the different cognitive skills and affective dispositions is necessary.

Existing programmes have largely focused on assessment before evaluating such thinking, thereby neglecting research on how to develop such thinking through teaching and learning activities. Clearly there are many different ways to link courses together to achieve the desired outcomes. However, a curriculum should conform to a model that is based on what the faculty expects to observe in its learners as a result of their participation in the programme. Learning is an evolutionary process. Courses need to be sequenced in a meaningful way that is consistent with the purpose or direction of the learning model. Hence, programme design is said to be an intermediate step between the faculty's articulation of a learning model and the assessment of learner outcomes (Moon, Birchall, Williams & Vrasidas, 2005: 370-384). Traditionally, the approach to the development and facilitation of critical thinking among learners has been fragmented, rather than a holistic approach. Therefore, it is necessary that a programme is developed to facilitate the critical thinking of learners in nursing education.

Jeffries (2005: 96-103) argues that developing a thinking skills programme is both a challenge and an opportunity. The challenge lies in the fact that there are few comprehensive or up-to-date programme models to build on or to adapt. Developing a critical thinking skills programme is also an opportunity because when it is done well, a programme designed to teach thinking skills benefits the faculty immensely. It also benefits the combination of instruction and assessment in each content area, as well as teacher education and models of instructional leadership generally (Yang, Newby & Bill, 2008: 1572-1585).

This implies that curriculum redesign is necessary, with the focus on critical thinking as the core outcome of the programme. The programme must define its relationship to several disciplines, and must present the corresponding curriculum to learners in a coherent manner that speaks to their needs, as well as to the college's desired outcomes (Moon et al., 2005: 370-384).

James and Francis (2011: 131-136) state that despite calls for nursing education to change in order to keep abreast of anticipated trends in health care, nursing schools have been slow to respond. The literature is awash with new buzzwords for nursing education, "critical thinking" being one of the buzzwords. James and Francis (2011: 131-136) further assert that despite reluctance on the part of many faculties, serious change must be made, and these changes must begin with the philosophy and conceptual/organisational frameworks of the programme. The critical aspect here is to have a well-articulated mission and programme objectives that will provide a coherent curricular purpose. Much effort has been devoted to teaching learners what to think, and perhaps it is time to move towards teaching them how to think. Furthermore, by instilling critical thinking in learners, we groom individuals to become lifelong learners, thus fulfilling one of the long-term goals of educational enterprise (Barnard, Nash & O'Brien, 2005: 505-510). The most appropriate manner to facilitate critical thinking in learners in nursing education is to enshrine content within a critical thinking programme.

In a study by Tibbitts (2005: 107-113), an observation was made that the changing health care environment, coupled with new and expanded practice roles for nurses, has led educators to take a closer look at the content, design, and delivery of nursing curricula.

Having noted this, it is clear that much has been done to assess and evaluate the critical thinking of students in nursing education. However, the available critical thinking programmes do not address critical thinking fully. Either they address only some critical thinking skills, or the affective dispositions are relegated to a less important position. Educators cited difficulty in teaching critical thinking, as they experienced difficulty in developing teaching methods for teaching such thinking.

Tibbitts (2005: 107-113) found that even though critical thinking is a necessary element of competent nursing practice, a requirement for programme accreditation, and a current goal of nursing education, evidence suggested that nurse educators continue to use methods that hinder advanced thinking development, and that recent nursing graduates are lacking in their ability to think critically. Even though educators feel that critical thinking is a valuable and important objective of their teaching effort, they still encounter several barriers on the part of both educators and learners. The other counterproductive aspect is that educators continue to use conventional methods of instruction, which further promote rote learning and learner dependence on the teacher.

Conventional methods of instruction too often focus on instructor-designed learning objectives, large group lectures, prescriptive assignments, structured clinical and laboratory experiences, and multiple choice questions. While conventional teaching methodologies regard the learner as a recipient of information, and the faculty as the expert deliverer of that information, new instructional methodologies focus on learning as a shared, collaborative process between faculty and learners, where learners assume an active role in their education (Dykman & Davis, 2008: 157-164).

Therefore, while supporting and encouraging professional development for the faculty, nursing programmes need to consider ways of dealing with learners' resistance to active learning. Learners need to be educated to adopt independent, active learning approaches from the onset of the programme. The faculty needs time to plan, prepare, and learn innovative teaching strategies associated with the development of critical thinking.

The kind of teaching-learning methodologies that foster learners' inquiry, critical thinking, accountability, and self-mastery skills include case studies and simulated clinical situations that encourage learners to engage in the process of problem-solving from within a "safe" environment (Dykman & Davis 2008: 157-164).

Rather than memorising information, learners become invested in building their repertoire of learning skills in the present and throughout their professional rationale. Content must be evaluated on a regular basis for relevance. However, it is unfortunate that knowledge cannot be transmitted, as knowledge assumes understanding. Knowledge is generated by the self. Through one's own efforts, one develops a conceptual system that is always growing, developing, expanding, and being revised (Barnard et al. 2005: 505-510).

To be well educated, that is, to know, requires that the learner exert their own intellectual power to make an effort to work with the information so that it leads to insights, comprehension, understanding, meanings, and generalisations. It is this involvement with information transformed into knowledge that ultimately enables one to become a critical thinker. The educator can devise strategies that provoke this process (Kuhn & Park, 2005: 111-124). Distler (2007: 53-59) propose curriculum revisions that will enhance the development of greater learner confidence and competence in nursing skills, and a programme that will provide an environment for learners that facilitates critical thinking and self-paced learning opportunities.

The relationship between thinking styles and critical thinking lies not only in the contribution of critical thinking to the literature, but also in its significant implications for education at the level of instruction and assessment, as well as at the level of curriculum development and academic programme development. If cultivating critical thinking dispositions is one of the objectives of education, a good academic programme and curriculum should be composed of various well-integrated components, each focusing on the cultivation of particular stylistic dimensions of learners, depending on the particular critical thinking disposition that a particular academic subject is supposed to develop (Worell & Profetto-McGrath, 2007: 420-426). It therefore becomes imperative to develop a programme that will include all the teaching-learning methodologies that will facilitate critical thinking in learners.

Gibbon (1998) in the National Plan for Higher Education (2001) is of the opinion that the skills needed for the 21st century are knowledge re-configuration skills, networking, and negotiation/mediation competencies, among other things. Critical thinking includes more than just the intellectual domain of human functioning, as it is supported by other domains, such as the affective domain. This is supported by Facione (1990: 13), who concurred that just as with the cognitive dimension of critical thinking, it is important to consider ways of developing materials, pedagogies, and assessment tools that are effective and equitable in their focus on the affective dispositions.

Critical thinking promotes rational autonomy, intellectual freedom, and the objective of reasoned and evidence-based investigation of a very wide range of personal and social issues and concerns. Critical thinking is an essential component of practice, communication, problem-solving ability, and theoretical and conceptual understanding of nursing concerns and research endeavours that advance the knowledge base of nursing (Miri, David & Uri, 2007: 353-369). This clarifies the fact that demonstration of critical thinking in the clinical setting is a universally expected behaviour of professional nurses.

Nurses require skills in critical-reflective thinking and self-directed learning as a critical path to empowerment. Interactive learning strategies and interdisciplinary seminar experiences in the curriculum are founded on the process of critical thinking, and incorporate the concepts of empowerment and self-directed learning, not only for the recipient of care, but for learners and the faculty as well (Miri et al., 2007: 353-369). Critical thinking threatens the calm of assumed amiability that governs much of our interaction. This means that when teachers and learners are aligned in pursuit of improved critical thinking, cognitive “magic” is possible.

Reasoning improves without the encumbrance of the automatic animosity that can ruin the atmosphere for prospective critical thinking. A critical thinking classroom plays a facilitative role in the fragile potential for a broad community of critical thinkers. However, this depends on the willingness of both the educator and the learner to engage in the hard work necessary to realise this exciting aspiration.

Despite the fact that there has now been considerable discussion and much work done globally on the goal of cultivating learner thinking, in many ways we still have a long way to go. There is still insufficient appreciation of the global shift that a genuine cultivation of learners' critical thinking requires (Costa, 2008: 77).

Dewey (1998: 9) indicated that genuine freedom is intellectual, in that it rests in the trained power of thought, the ability to turn things over to look at matters deliberately, to judge the amount and kind of evidence at hand, and if there is no evidence, where and how to seek such evidence. Critical thinking is therefore a liberating force in all human thought activities, including those of nurses. According to Turner (2005: 272-277), critical thinking is an indispensable component of education, and a trait of an educated person. Educated people are not only well learned, but also think well. Critical thinking offers methods to transform learners into active participants in their own intellectual growth.

It is the South African Nursing Council's (SANC Document, 1999: 15) objective to produce a practitioner who will fulfil the role of provider, collaborator of health care, professional, and advocacy role-player. Critical thinking is the basis of self-reliance and professional functioning, and is essential in the South African dynamic health care system. Within these multifaceted roles of the registered professional nurse, these skills are pivotal, and all these roles require a strong disposition towards critical thinking, and strong critical thinking skills (Turner, 2005: 272-277). The competencies required for these roles are, among other things, problem-solving and critical thinking.

Given the previous assertion, evidence suggests that there is still a problem with the critical thinking of nursing practitioners, as evidenced by the steady increase in the number of disciplinary hearings conducted by the SANC (SANC Statistics, 2008-2013). Riddell (2007: 121-126), stressed that nursing education should sharpen learners' critical thinking, make them responsive to their own reflection, foster creativity, build moral purpose, enhance their capacity to be in a relationship with patients, create caring, and enable them to tap into their intuition. Facilitation of these skills and dispositions becomes difficult if the educational programme does not have critical thinking as an outcome, which will ensure continual facilitation of this skill.

Despite the fact that nurses have been continually exhorted to critically examine and critically analyse nursing knowledge, critical thinking has not been facilitated as expected (Riddell, 2007: 121-126). In a study by Del Bueno (2005: 278-282) it was found that nurses are not curious or open-minded, and have no humility, courage, or perseverance, which are virtues of critical thinking. The tendency is to think and function in a robotic manner, or to think in a group.

This is evidenced by the numbers and nature of disciplinary hearing cases heard by the SANC, and the negative media reports about gross negligence and dehumanising care given to patients/clients by nurses. During the period July 2008 to December 2013 one hundred and forty seven (147) cases were heard (SANC 2008-2013). The significance of most of these cases were the result of a lack of critical thinking on the part of the nurses, where they just acted without thinking about how to deal with the issues at hand, and the consequences of just “doing”.

Understanding of the role of critical thinking skills and dispositions in the development of competent professional nurses is contributing to a substantial paradigm shift in nursing education. Besides the teaching of the facts and principles necessary to develop knowledgeable professional nurses, pedagogical approaches must foster the development of critical thinking. Therefore, there is pressure from within and outside the profession regarding the nursing profession’s purpose, educational preparation, role in practice, theory, research, and its related medicine.

According to Vacek (2009: 45-48), critical thinking is convergent, since it is essentially evaluative in nature. It involves the precise, persistent, and objective analysis of any claim, source, or belief. It seeks to judge the accuracy, validity, or worth of any claim, source or belief. However, it is worrying to observe that although many teachers sincerely believe that they are teaching critical thinking in their classrooms, much of, if not most of, what they usually do to this end consists only of making students think. Classrooms that encourage critical thinking possess distinguishing features that assist programme evaluators and educators to assess whether critical thinking is a regular occurrence in a particular classroom.

Critical thinking focuses on a set of skills and attitudes that enable a listener or reader to apply rational criteria to the reasoning of speakers and writers. Classrooms that are alive with critical thinking encourage commitment, but also urge the wisdom of frequent re-examination of that commitment as learners encounter fresh logic, evidence, metaphors, and narratives (Kumagai & Lyson, 2009: 782-787). Despite the current interest in developing critical thinking as the focus in nursing education, most studies have documented that nurse educators have not demonstrated that the professional programme of study has significantly increased critical thinking in their professional nursing graduates (Duchscher, 2009: 1103-1113). This state of affairs necessitates a programme that will contain an infusion of content and provide clear guidelines to the educator on how to implement the programme, of which the ultimate aim will be the production of a critically thinking graduate.

Tanner (2006: 204-211) states that there is evidence that there has been an enormous amount of study on the conceptualisation of critical thinking, its relationship to clinical decision making, and the best way to measure it as an outcome of undergraduate education, with very little study on how to develop learners' abilities in critical thinking. The researcher therefore believes that the programme envisaged for development will address Tanner's and other researchers' concerns. Research suggests that there is little, if any, explicit instruction in thinking in most classrooms. Instead of providing instruction on how to engage in thinking, educators generally place learners in situations where they must engage in thinking, to whatever degree they can. This approach assumes that simply by forcing learners to think, however well learners understand how they are thinking, they will learn to think better.

Educators in higher education often have a single clear model of their instructional role. They are the experts about a body of knowledge, and the learners are seeking that knowledge. Thus, the one with the knowledge speaks, and the one seeking knowledge listens. Lecturers, even at their most eloquent and persuasive, possess a major inadequacy, namely that they fail to provide the learner with the opportunity to practise using the knowledge under the guidance of a skilled mentor (Vacek, 2009: 45-48). This is a fallacious assumption, and by honouring its practice, educators actually inhibit rather than promote the development of the learner's proficiency in thinking (Del Bueno, 2005: 278-282).

Mooney and Nolan (2006: 240-244) contend that bodies of knowledge are important, but that they often become outdated. Thinking skills, on the other hand, never become outdated. To the contrary, they enable us to acquire knowledge and to reason with it, regardless of time or place, or the kinds of knowledge to which these skills are applied. Therefore, it makes sense that whatever thinking skills one acquires during an educational programme, these skills can never be taken away from the self. This implies that such skills are a lifetime investment that will come in handy throughout the career of a nurse, and in her life in general.

Developing such thinking, critical thinking included, requires attention to affect, to technique, to knowledge, as well as to application, in managing the thinking, as well as in executing it. Mooney and Nolan (2006: 240-244) furthermore contend that because “skill-full” thinking is neither as natural nor as common as we would like it to be, and because it is not likely to develop automatically or incidentally, we need to intervene in formal education. Settings to help learners improve their abilities to engage in this important process are necessary. Therefore, it is important that nursing education programmes facilitate critical thinking. A deliberate process of infusion of critical thinking in content should be a part of the nursing education programme. Levett-Jones (2005: 363-368) argues that nursing education should abandon the “behaviourist” paradigm, as this way of thinking promotes an orientation towards task performance, rather than towards cognitively driven questioning of theoretical constructs that support the desired behaviours. This way of thinking diminishes the motivation to understand or inquire into underlying premises or contextual implications, and encourages rote application of “understood” nursing principles.

Teaching learners the elements, principles, and characteristics of critical thinkers is a good start, but it is not enough. They must see these concepts consistently applied by educators, and they must be encouraged to integrate a critical approach to thinking in both their academic and their practical nursing environment (Levett-Jones, 2005:363-368). The faculty can teach in such a manner that they role-model critical thinking in both the classroom and the clinical setting (Profetto-McGrath, 2005: 364-371). Given the previous assertions, it is important to note that the approach would be to develop a programme to facilitate critical thinking, with attention being given to ensuring that all the cognitive skills and affective dispositions of critical thinking are included.

The problem with existing critical thinking programmes is that some skills are used to the exclusion of others, and very little of the affective dispositions are taken care of, as already discussed in this section.

Mooney and Nolan (2006: 240-244) assert that graduates should be able to make well-reasoned decisions, solve problems skilfully, and make carefully thought-out judgments about the worth, accuracy, and value of information, ideas, claims, and propositions. It is not enough to produce a technician or a professional.

Nursing is grounded in practice, and with this in mind, educational principles and procedures should foster critical thinking and problem-solving. As nursing has evolved from an occupation to a profession requiring cognitive and affective skills, nurses have progressed from task orientation to skilled professionalism based on well-developed knowledge. Decisions made by nurses often involve complex problems concerning the physical and psychosocial well-being of clients and the interaction with other disciplines.

As clients' status changes, the nurse must recognise, interpret, and integrate new information and make decisions about the course of action to follow. Responding to the need for independent decision-making in the clinical setting, nursing education has placed increased emphasis on critical thinking (Tanner, 2006: 204-211). However, it is worrying to observe that the ideal has not been achieved, since the process has been approached in a backwards-and-forwards manner. Hence, the purpose of this study is to develop, implement, and evaluate a programme to facilitate the critical thinking of learners in nursing education.

However, there is no doubt that the nurse educator has to reflect on the lesson plan and ensure that the teaching-learning strategies used facilitate critical thinking. Assessment and evaluation strategies should test both the cognitive skills and the affective dispositions of critical thinking. Therefore, it is imperative that critical thinking instruction should aim at developing good critical thinkers, that is, individuals who can integrate the successful execution of various skills in the critical thinking-enhanced classroom with confidence and good judgment to use these powerful tools in their other studies, and in their everyday lives (Facione, 1990: 2-11).

Nursing “higher education” should offer a genuine higher education, in the sense that what is ultimately required of the learner is higher-order thinking, whether as formal thought or as embodied in professional action (Tanner, 2006: 204-211). Tanner (2006: 204-211) further asserts that the learning has to be transcended. Learners have to show that they understand what has been learned so deeply that they are able to look at it and assess it critically themselves. This ideal can only be realised through an educational nursing programme that has critical thinking built in as an ultimate outcome. Therefore, it is imperative that a programme be developed, implemented, and evaluated to facilitate the critical thinking of learners in nursing education.

1.2 PROBLEM STATEMENT

Nurses in today’s challenging health care settings need to be skilled critical thinkers. This is because of the fluid nature of health care systems, technological advancements in medicine, the ever-growing demands of patients/clients for appropriate care, and the demands of societies for knowledge of their rights. The role of the nurse has become more complex, with more responsibilities being placed on them in relation to problem-solving and decision-making with regard to patient care. To be able to fulfil this role efficiently, the nurse has to be a critical thinker. The multifaceted roles of the registered nurse require strong critical thinking dispositions and strong critical thinking skills (Vacek, 2009: 45-48). Critical thinking is an important virtue of a well-educated practitioner. Facione (1990:5) articulated that critical thinking is conceived of simply as a list of logical operations and domain-specific knowledge, and as an aggregation of information. However, this is not the case; the ideal is to be able to apply these skills in everyday life.

There has been a steady rise in the number of professional disciplinary hearings conducted by the SANC, and negative media reports about gross negligence and inhumane treatment of patients by nurses. During the period July 2008 to December 2013 147 cases of misconduct were heard by the SANC (SANC Statistics 2013). This clearly points to the fact that nurses work in rigid, robotic manner. There is rote application of nursing principles, without any deliberate and objective critical thinking about the issues at hand.

This is supported by Vacek (2009: 45-48), who concurs that critical thinking is the basis of self-reliance and professional functioning, and is essential in the South African dynamic health care system. This clearly points to the need for a practitioner who is a critical thinker, which unfortunately is not the case with South African nursing graduates.

Burns and Foley (2005: 351-357) asserts that the mistake made by nurse educators is to use one approach to answer all nursing education needs. For example, behaviour modification has failed to allow for connected learning and constructed knowledge, for emancipatory education, for critical thinking, and for participatory power structures. It strives for objectivity and disparages intuitive knowing. Unfortunately, nurse educators are stuck with the traditional way of teaching-learning for employment, instead of teaching/learning for employability, which will not produce the ideal graduate envisaged by employers in health care.

The objective of the SANC (1999/15), the South African Qualifications Authority Act (SAQAA 58 of 1995) critical cross-field outcomes, the National Plan for Higher Education (2001), and Batho Pele document (1997) of producing a practitioner with problem-solving abilities and critical thinking skills has still not been achieved. Existing nursing education programmes focus on evaluation, and there is no clear direction on how critical thinking can be facilitated as a programme outcome. If critical thinking is a programme outcome, it is not addressed fully, as some skills are excluded, and very little is done about addressing the affective dispositions of critical thinking. This poses a problem, because how can one evaluate that which one has not actively facilitated?

There is an inclination by nurses to practise in a rigid manner because they are rote-learned and are bound by nursing care protocols that stifle the active use of critical thinking. The researcher observed that the methods of teaching and assessment of critical thinking are not used uniformly by faculty in an institution of higher education. Critical thinking is not understood and appreciated by all as the ideal outcome of the nursing programme in nursing education, which is evidenced by the haphazard manner in which critical thinking is facilitated. It is the researcher's belief that critical thinking should be the core outcome of the programme. Therefore a study to develop, implement, and evaluate a programme to facilitate the critical thinking of learners in nursing education is necessary. The following research question arose from the problem statement:

How can a programme to facilitate critical thinking in nursing education be developed, implemented, and evaluated using the critical thinking framework, namely the context, conceptual, methodological, evidential and criteriological aspects?

1.3 PURPOSE AND OBJECTIVES

The purpose of this study was to develop, implement, and evaluate a programme to facilitate the critical thinking of learners in nursing education. This purpose was attained through the following objectives:

- to explore and describe the perceptions of nurse educators on how the critical thinking framework can be used in nursing education,
- to conceptualise the findings,
- to develop a programme to facilitate critical thinking in nursing education,
- to describe the implementation of the developed programme to facilitate critical thinking in nursing education and
- to describe the evaluation of the implemented programme to facilitate critical thinking in nursing education.

1.4 DEFINITION OF KEY CONCEPTS

The key concepts in this study are “programme”, “facilitate”, “critical thinking”, “nursing education”.

➤ *Programme*

A programme is a purposeful and structured set of learning experiences that lead to a qualification. Programmes may be discipline based, professional, career-focused, trans-inter- or multi-disciplinary in nature (NQF in Higher Education Act, Act 101 Of 1997). For the purpose of the study a programme is a set of lesson plans that guide individual educators in their selection of learning outcomes, content, teaching strategies, and assessment procedures (Gorsky & Caspi, 2005: 1-11).

➤ *Facilitate*

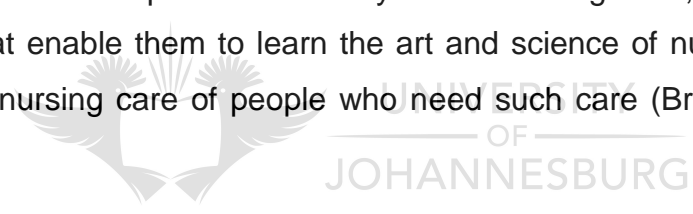
To facilitate is to promote critical thinking through the creation of an environment that is conducive to such thinking, using a dynamic interactive process (Theory for Health Promotion in Nursing, University of Johannesburg, 2009).

➤ *Critical Thinking*

Critical thinking is purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations on which judgment is based (Facione, 1990: 2).

➤ *Nursing Education*

Nursing education is the process whereby learners are guided, assisted, and provided with means that enable them to learn the art and science of nursing, so that they can apply it to the nursing care of people who need such care (Bruce, Klopper & Mellish, 2011: 7).



1.5 RESEARCH DESIGN AND METHODS

The research design is the structure within which a study will be implemented (Burns & Grove, 2009: 225). The research design of this study comprises of the research strategy, the population, sampling, the method of data collection, data analysis and interpretation, and trustworthiness. The research design is described in detail in Chapter 2.

1.5.1 Research strategy

The research strategy of this study was a qualitative, exploratory, and descriptive design that was contextual in nature (Burns & Grove, 2009: 30; Mouton, 2009: 102-107). The purpose was to develop, implement, and evaluate a programme to facilitate critical thinking in nursing education.

The study was divided into four phases, namely the empirical, conceptualisation, programme development, and implementation and evaluation phases.

PHASE 1: Empirical Phase

Phase one of the study was the empirical phase that included focus group interviews and follow up individual interviews of nurse educators on how to facilitate critical thinking using the critical thinking framework (Krueger, 2009: 6). The perceptions of nurse educators on how the framework of critical thinking can be used to facilitate critical thinking in nursing education were explored and described. A sample of nurse educators was purposively selected using a non-purposive sampling method (De Vos, Strydom, Fouche & Delpont, 2011: 343-346; 349). Miles and Huberman's (1994: 10-12) conception matrices method of data analysis was used to analyse the collected data. The frameworks of Lincoln and Guba's (1985) as well as Polit & Beck (2012) were used to establish trustworthiness of the study.

Phase 2: Conceptualisation

Phase two dealt with the conceptualisation of the findings from phase one within Dickoff, James and Wiedenbach's (1968) practice theory. The following reasoning strategies were used for conceptualisation of the collected data within the critical thinking framework (Facione 1990): induction, deduction, analysis, synthesis, derivation, and inference. These strategies are described fully in Chapter 2. The conceptual framework emanated from the conceptualisation process which formed the basis for description of the guidelines for the implementation of the critical thinking programme.

Phase 3: Programme Development

Phase three involved the development of the programme to facilitate critical thinking. Programme development was conducted after an extensive literature review pertaining to critical thinking and the programme development frameworks. The conceptualised data was used within the critical thinking framework to develop the programme (Facione, 1990).

Phase 4: Programme Implementation and Evaluation

Phase four of the study was the implementation and evaluation of the programme. The programme was implemented using the described guidelines in a first year class of the Bachelor of Curationis programme in an institution of higher education, after which the learners were requested to evaluate the programme by giving feedback to the researcher on how they experienced the programme. They gave feedback through focus group interviews (Krueger, 2009: 6). Original contribution, justification, limitations, recommendations, and conclusions are described in this phase.

1.6 TRUSTWORTHINESS

Trustworthiness in the study was ensured through the use of Lincoln and Guba's (1985) as well as Polit and Beck (2012) frameworks of trustworthiness. All the methods are described in detail in Chapter 2 of this study.

1.7 ETHICAL CONSIDERATIONS

Dhai and McQuoid-Mason (2011: 13-14) framework was used to meet the requirements of ethical considerations in the study.

1.7.1 Scientific integrity of the research

The researcher has undergone training in research methodology and holds a master's degree. The study was supervised by a professor who has extensive experience in qualitative research, therefore, the highest quality possible was maintained throughout this study. The researcher adhered to the standards of planning, implementation, evaluation, and reporting of this research project. The researcher maintained honesty, acted in good faith, and further adhered to predetermined agreements throughout the research. Furthermore the researcher ensured that the research process and the results are trustworthy. The research was conducted meaningfully, and will contribute to the improvement of nursing practice.

1.7.2 Consent

Written informed consent was obtained from all the participants. The purpose, objective, and nature of participation in the study was explained fully to the participants. Additional permission to use a tape recorder during the unstructured individual interviews and focus group interviews was sought, and all tapes would be destroyed after the research. The participants were made aware of the fact that they would benefit from this study, as there were no inherent risks but that the nurse educators and nursing practice would benefit. Educators and learners will benefit in that the learners will develop critical thinking skills that they will apply in practice to make decisions and solve problems. The participants were also made aware of their right to terminate participation at any stage during the study, despite their initial consent to participate. Consent was also obtained from the Higher Degrees Committee, Academic Ethics Committee as well as the Head of Department of nursing in the institution of higher education under study.

1.7.3 Confidentiality and anonymity

No information will be divulged to other people except the researcher, independent coder and the study promoter in order to ensure confidentiality. No participant or institution were referred to by name. No names were used on the recorded tapes, symbols alone were used for identification. The participants were informed that all information gathered in this study will be kept under lock and key and only the researcher will have access. All the documents and tapes will be destroyed after the completion of the study.

To maintain anonymity the participants were requested not to refer to one another by name, but as "Colleague A", "Colleague B", etc. Should anonymity have been threatened, all research records would have been destroyed. The participants were informed that confidentiality would be waived only during publication of the results. Publication of the results will report aggregate data and no individual will be identified by name if quoted focus group statements are provided.

1.7.4 Privacy

The dignity and integrity of the participants were maintained throughout the study. Only the data necessary to reach the objectives of the study was collected, and the researcher did not go beyond what was necessary to achieve the objectives of the study. No information was used to embarrass the participants. Should privacy have been threatened in any way, or standards not been adhered to, the participants would have had the right to withdraw, in spite of their initial consent to participate.

1.7.5 Principle of beneficence

The principle of beneficence refers to the right to protection from discomfort and harm (Burns & Grove, 2009: 198). There are no envisaged risks or harm that will be caused by the study, however the educators and learners will benefit in that the educators will have a guide on how to facilitate critical thinking. The learners will develop critical thinking skills.

1.7.6 Principle of justice

The principle of justice has to do with fair treatment. According to Burns and Grove (2009: 198) this principle holds that people should be treated fairly and should receive what is due to them. Both the researcher's and the participants' roles will be clarified before data is collected and agreements will be adhered in order ensure that the participants are afforded fair treatment.

1.8 ORGANISATION OF PROPOSED CHAPTERS

Chapter 1: Overview of the study.

Chapter 2: Research design and methods.

Chapter 3: Description of the empirical findings.

Chapter 4: Conceptualisation.

Chapter 5: Programme development.

Chapter 6: Programme implementation and evaluation.

Chapter 7: Original contribution, justification, limitations, recommendations and conclusion.

1.9 SUMMARY

Critical thinking is the buzzword in all educational programmes. Nursing education is challenged by the dynamic and fluid nature of the health care system. Consumers of health care are changing by the day, and their health care demands are becoming complex. This complexity in client requirements requires that the nursing practitioner become a critical thinker who will be able to solve patient/client problems comprehensively and independently using critical thinking. This study was important, as a programme to facilitate the critical thinking of learners was developed based on the data collected during the empirical phase as described by the nurse educators. The framework of critical thinking as described by Facione (1990) was used to develop the programme and Dickoff et al.'s (1968) Practice Theory framework informed the steps of programme development. The research design and methods are described in Chapter 2.



RESEARCH DESIGN AND METHOD

2.1 INTRODUCTION

The overall purpose of this chapter is to describe the research design and the methods that will be employed in this study. The study was conducted in four phases. The phases were the empirical phase, conceptualisation phase, programme development phase, and the programme implementation and evaluation phase. The methods in each phase will be described in greater detail.

2.2 THE DESIGN OF THE STUDY

A qualitative, exploratory, and descriptive design that is contextual in nature (Burns & Grove, 2009 : 45, 237; Mouton, 2009 : 103-106) was used to develop, implement, and evaluate the programme to facilitate critical thinking of learners in the Bachelor of Curationis programme at an institution of higher learning leading to registration as a nurse (general, community, psychiatry) and midwife.

2.2.1 Qualitative

Qualitative studies aim to explore the meaning or describe and promote understanding of human experience of phenomena (Brink, 2006: 119). The study was qualitative as the researcher wanted to explore the depth, richness, and complexity of the nurse educators' perceptions regarding how a programme to facilitate critical thinking using the critical thinking framework can be developed and the learners' experiences concerning the implemented programme (Burns & Grove, 2009: 51-64).

2.2.2 Exploratory

Exploratory studies are used to explore dimensions of a phenomenon and the manner in which it is manifested. It provides more insight about the nature of a phenomenon (Brink, 2006:11).

The design of this study was exploratory (Burns & Grove, 2009: 359; Mouton, 2009: 102-103) in that the researcher explored the perceptions of the nurse educators during the empirical phase on how to develop a programme to facilitate critical thinking. The researcher further explored the experiences of the learners of the programme after its implementation and evaluation in phase four of the study. Extensive literature was explored during the conceptualization phase.

2.2.3 Descriptive

According to Brink (2006: 11), the purpose of descriptive studies is to obtain complete and accurate information about a phenomenon. The design of this study was descriptive in that the researcher aimed to obtain complete and accurate information about the development of a program to facilitate critical thinking and how the learners experienced the programme. The findings of the perceptions of the nurse educators were used to describe the process of facilitating critical thinking following the critical thinking framework. Conceptualisation took place in phase two of the study, where concepts and frameworks of critical thinking and programme development derived from the literature were used to describe the programme. An exploration of the literature on critical thinking and programme development culminated in the description of the programme in phase three of the study (Burns & Grove, 2009: 237-239). The programme implementation was described in phase four of the study, followed by the description of the explored experiences of the learners regarding the developed programme during the evaluative stage of the study.

2.2.4 Contextual

According to Mouton (2009: 133) phenomena are studied because of their intrinsic and immediate contextual significance. Critical thinking is an educational learning outcome of all educational programmes in general and that of all nursing programmes in particular since nursing is a hands-on profession that deals with the lives of patients. In South Africa critical thinking is one of the critical crossfield learning outcomes determined by the South African Qualifications Authority Act (Act 58 of 1995) and the South African Nursing Council. This study has contextual significance in this era of transformation in the domain of education.

2.3 RESEARCH METHOD

The study was divided into four phases. The research methods constitute a description of the population, sample and sampling method, data collection, data analysis, and trustworthiness (Burns & Grove, 2009: 377-380; Mouton, 2009: 107). The methods used in each phase are described.

2.3.1 PHASE 1: The exploration and description of the perceptions of nurse educators regarding how a critical thinking programme can be developed.

The purpose of this phase was to explore and describe the perceptions of the nurse educators on how a programme to facilitate critical thinking can be developed using the critical thinking framework. The population, sample and sampling, data collection, data analysis, and trustworthiness methods that were used are described below.

2.3.1.1 Population

A population is a collection of individuals who have some common characteristics that are of interest to the researcher (Brink, 2006: 132; Mouton, 2009: 134). The population from which a sample for this study was drawn consisted of educators in the health sciences faculty.

2.3.1.2 Sample and Sampling

Sampling refers to the process of selecting the sample from elements in the target group (Brink, 2006: 133). Nine nurse educators volunteered to participate in each of the four focus group interviews. The following inclusion criteria were used to select the sample:

- nurse educator registered for an additional qualification in nursing education with the SANC,
- nurse educator with three or more years' experience of teaching in higher education, and is currently teaching in the B.Cur degree programme in an institution of higher education.

- English was the nurse educators' second language.
- The minimum teaching experience of the educators in higher education was 5 years and above with clinical experience of +/- 23 years as average.
- Their ages ranged from 40-55 years
- Their cultural background was black.

As the study was contextual in nature a sample of nine nurse educators from a staff establishment of twenty volunteered to take part. A non-probability purposive sampling method was used to draw the sample (Burns & Grove, 2009: 355). This method of sampling was appropriate, as the researcher was looking for nurse educators who would be willing to bring forth the specific, rich, and in-depth information regarding how a critical thinking programme can be developed using the critical thinking framework. The nurse educators were appropriate for the study as they practiced in diverse clinical settings and had been practicing critical thinking. They used interactive learning strategies and technology to teach critical thinking.

2.3.1.3 Data Collection

The researcher departed from an etic perspective or orientation by exploring the perceptions of nurse educators regarding how a critical thinking programme can be developed using the existing framework developed by exponents of critical thinking (Facione, 1990). Critical thinking is said to be a purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations on which judgment is based (Facione, 1990: 2). The researcher focused on the contextual, conceptual, methodological, evidential and criteriological dimensions of the framework which could be used to develop the programme. Data was collected through the use of a focus group interview. Krueger (2009: 6) states that a focus group interview is a carefully planned discussion, designed to obtain perceptions on a defined area of interest in a permissive and non-threatening environment. Krueger (2009: 6) further asserts that a focus group is conducted with seven to twelve people and facilitated by a skilled interviewer. In this study the researcher conducted four focus group interviews whereby each group consisted of nine nurse educators.

The researcher conducted follow up individual interviews with eight participants as a way of member checking and verifying the data collected during the focus group interviews (De Vos, Strydom, Fouche & Delport, 2011: 343-346, 349). The questions regarding the perceptions of the participants were asked according to the dimensions of the critical thinking framework as follows:

- How can the context of a setting facilitate the development of a critical thinking programme?
- How can a critical thinking programme be developed using the conceptual dimension of the critical thinking framework?
- What methodologies of critical thinking can be used to facilitate critical thinking in the developed programme?
- How can the evidential dimension of the critical thinking framework be used to facilitate critical thinking in the developed programme?
- How can the criteriological dimension of the critical thinking framework be used to facilitate critical thinking in the developed programme?

The term “Interview” signifies the presence of a trained moderator and therefore the researcher used the services of an interviewer, who has interviewing skills (a psychiatric nurse) and who has the knowledge and experience of qualitative research methods (De Vos et al, 2011: 342-343). The objective was to have someone who has interviewing skills and would be able to get the participants to give the information that the researcher was looking for. Data was collected within the guidelines for focus group interviews as described under the following headings: preparation, techniques, skills, and attitude of the focus group interviewer (Krueger, 2009: 6-7).

Guidelines to conduct the focus group interview:

➤ Preparation

The focus group interviews were conducted during a Friday afternoon since it was convenient for the nurse educators. The researcher received ethical clearance from the Higher Degrees Ethics Committee of the institution of higher education and obtained permission from the head of the department (HOD) as well as the participants to conduct the research.

A comfortable and conducive environment was used for the focus group interviews, away from distractions such as noise and ringing telephones. A non-threatening, non-intimidating and informal atmosphere was created by the researcher, with chairs arranged in a circle around a centrally placed table to facilitate face-to-face interaction. A tape recorder was used with permission of the participants for accurate collection of data. This enabled verbatim transcription of the data.

The researcher could read the transcripts repeatedly to be immersed in the data, which enhanced prolonged engagement, thus meeting one of the requirements of establishing the credibility of the study (Lincoln & Guba, 1985: 316-327).

The researcher was in-charge of the tape-recorder, with a clean cassette in place and extra ones available should the need arise. The participants were issued with alphabets to pin on themselves, so they could refer to one another by the letters instead of calling each other by name, to ensure anonymity. For an example colleague A or B etc.

The participants were requested to set ground rules in order to facilitate a smooth running and effective focus group interview. The ground rules emphasized on mutual respect for one another, empathy, flexibility, openness, and unconditional acceptance of each other's views. The focus group interviews lasted for 60 minutes each as the same information was coming up several times indicating the saturation of data. Participants were given sufficient time to explore their perceptions regarding how a critical thinking programme can be developed. Refreshments were served to the participants after the interviews.

➤ **Techniques, skills and attitude**

The researcher welcomed all participants and introduced the interviewer to the participants. The researcher explained the purpose of the study and handed out consent forms to the participants to sign before the focus group interview was commenced. The researcher further gave a brief overview of the study. The participants were encouraged to ask questions should they not understand something.

The questions were given to the interviewer. The researcher drew the interviewer's attention to the importance of obtaining in-depth information from the participants. The researcher took comprehensive notes during the discussions, and at the same time, most importantly, took note of the participants' group dynamics, both verbal and non-verbal cues, facts, opinions, emotions, and unexpected information that could add value to the discussion.

The researcher also operated the tape recorder placed on a centrally situated table to capture every participant's voice clearly. The interviewer allowed dialogue and open discussion to determine and establish the depth of the participants' perceptions on how a critical thinking programme could be developed.

➤ **The role of the interviewer**

After laying down ground rules with the participants, the interviewer posed the relevant question according to the individual dimensions of the critical thinking framework to the participants. The interviewer further asked related and follow-up questions as determined by the participants' responses. The interviewer probed in a friendly, reassuring, and non-threatening manner, so as to obtain in-depth information. The interviewer employed interviewing skills such as establishing rapport, active listening, smiling warmly, reflecting, responding, nodding, silence, paraphrasing, consistency, probing, empathetic understanding, and bracketing to encourage in-depth exploration of the phenomenon under study.

The participants' thoughts and feelings were gently probed and clarified through paraphrasing and reflecting to better understand the nature of their responses. Focusing made way for enhanced understanding, as it allowed the participants to concentrate on one question without moving forward and backwards between questions.

The participants' unrelated issues and responses were followed up on and clarified because they could unearth information that would have otherwise remained untapped. The interviewer took note of uncertainty and vague or generalised responses, and encouraged specific and precise responses.

The participants were encouraged to give in-depth information as to how a critical thinking programme could be developed using the critical thinking framework. The interviewer summarised responses and sought consensus from the participants.

The interviewer also maintained a balance in the discussions by ensuring that the more outspoken participants did not take over and dominate the discussion. The interviewer encouraged the quieter participants to participate and involved them in the discussions.

The interviewer further reflected consent and feelings relating to new information, while remaining non-judgmental throughout the interview (De Vos et al., 2011: 820). Group dynamics were used to deal with distraction, and an atmosphere of openness and friendliness was maintained. The enthusiasm and interest of the participants was maintained throughout the discussions.

The interviewer's attitude was permissive, with a body language reflecting a keen interest in what was being discussed. When no new information was forthcoming, as demonstrated by repetition of already discussed information, which was an indication of saturation of the data, the interviewer summarised the discussion and invited the participants to approve the summary as a true reflection of what was discussed. The cassettes were labelled accordingly by the researcher and will be destroyed five years after the study. The interview was then terminated. The researcher further conducted individual follow up interviews with eight nurse educators to verify the collected data.

2.3.1.4 Data Analysis

The collected data was analysed through the use of Miles and Huberman's (1994: 10-12) qualitative data analysis method. Miles and Huberman's matrices were used to place the participants' perceptions that were gathered during the empirical phase according to the questions based on the critical thinking framework. The researcher analysed data collected in the empirical phases as follows:

- The researcher considered the research question and the key attributes and connotations of the available data. The matrix was roughly sketched.
- The matrix was set up on a large sheet so that it was all visible at once.
- The researcher avoided including more than a dozen words in a row or column. The perceptions were grouped meaningfully.
- Codes were used to locate key information from the written chunk of information so as to enable the researcher to easily get back to them in the content, should the need arise. Furthermore different colors were used to highlight the data.
- Specific illustrations from written up field notes were included.
- The researcher looked for examples that were genuinely representative of the conclusions they were presenting.
- The researcher read through the transcripts in order to get genuine responses, while concentrating on similar patterns, feelings, and thoughts.
- When saturation of data was reached, similar patterns were grouped together to derive meaningful categories.
- Content-analytical summary tables were used to clarify the researcher's understanding.
- The entries were revised repeatedly until data was saturated.
- Conclusions were checked, confirmed, and verified for accuracy.

The data analysis protocol was given to an independent coder to analyse the collected data independent of the researcher. The independent coder was who was purposively selected as he possessed a PhD. Thereafter a consensus discussion meeting between the researcher and the independent coder was held to verify the accuracy of data analysis. This increased the trustworthiness of data analysis.

2.3.1.5 Trustworthiness

Lincoln and Guba's (1985: 316-327) strategies to ensure trustworthiness in qualitative research were used. These strategies are credibility, transferability, dependability, and confirmability. The researcher further used Polit and Beck (2012: 585) to establish authenticity of the study. How trustworthiness was established during this study is described below.

➤ *Credibility*

Prolonged engagement was used to ensure credibility during the empirical phase. The researcher got immersed in the data collected by repeatedly reading the transcripts over and over again.

The researcher has undergone a one year training in research methodology, holds a master's degree in professional nursing science: nursing education, was promoted by a professor who is an expert in qualitative research, and therefore can attest to the authority of the researcher.



Member checking is a process in which the researcher asks one or more participants in the study to check the accuracy of collected data (Creswell, 2013: 252). Member checking was done during the empirical phase through the follow-up individual interviews with the educators to verify data, and this also ensured prolonged engagement.

On the other hand, member checking during the focus group interviews was done by the interviewer by rephrasing or reflecting on the participants' comments so that the participants could verify the accuracy of the interpretation. An independent coder who is experienced in qualitative research was used to verify data and play the "devil's advocate" during data analysis. A consensus meeting was also held with the independent coder to verify the analysed data. The researcher also gave the developed programme to a group of experts who had PhD's in qualitative research to critique before the implementation, which further established credibility.

➤ *Transferability*

Transferability refers to the extent to which the findings from the data analysis can be transferred to other settings. Transferability depends on how thick a description of the method the researcher has provided (Lincoln & Guba 1985: 316-327).

Data was collected until it was saturated, and a detailed description of the design and method during the empirical phase, conceptualisation phase, development phase and implementation, and evaluation phases is provided.

The researcher provided enough descriptive data necessary to enable a prospective researcher interested in replicating the study to reach a conclusion about whether transfer can be contemplated as a possibility. A sufficient data base was produced, which can be used for replicating the study by prospective researchers (Lincoln & Guba, 1985: 316-327). This was indicated by the saturation of data during the focus group interviews.

➤ *Dependability*

Dependability is a strategy that is used to evaluate the quality of the data in qualitative studies and it refers to the stability of data over time. A detailed description of the method used in the programme development, implementation, and the evaluation phases, and the data analysis of the researcher's reflexive notes during these phases established the dependability of the study (Lincoln & Guba, 1985: 316-327).

An independent coder with experience in qualitative research analysed the data which was followed by a consensus meeting to agree on the themes and this further ensured dependability of the findings. A detailed description of the method used also ensured the dependability of the study and provided a database adequate for prospective researchers to use should they want to transfer the study to other contexts.

➤ *Confirmability*

Confirmability refers to the objectivity or neutrality of data. Field, reflective notes and audio-tapes were kept to account for events as they took place thus establish reflexivity (Lincoln & Guba, 1985: 316-327).

The researcher explored personal feelings and experiences about the development of a critical thinking programme in the institution of higher education that may have an impact on the study, and integrate understanding and insight into the study.

The reflexive exercise assisted the researcher to bracket preconceived ideas about facilitating critical thinking to avoid misinterpretation of the participants' experiences (Burns & Grove, 2009: 545-546). This process enhanced open-mindedness to new insights and knowledge. The audit trail clearly illustrated the evidence and thought processes used to arrive at conclusions.

➤ *Authenticity*

Authenticity refers to the extent to which the researcher fairly and faithfully showed a range of realities. The researcher ensured that during the focus group interviews the learners appreciated the viewpoints and construction of others. She further ensured that there is quality of balance in that the stakeholders' views, perspectives, claims and voices are apparent and reflected in the text of this study. Furthermore to ensure fairness the researcher prevented marginalization by acting affirmatively with respect to inclusion of the participants. To ensure catalytic authenticity the researcher followed-up on the participants' responses (Polit & Beck, 2012: 585).

2.3.2 PHASE 2: Conceptualisation of findings

Conceptualisation refers to the clarification and analysis of the key concepts in a study and the manner in which one's research is integrated into existing conceptual frameworks. (Mouton, 2009: 109). It involves exploration of literature in order to arrive at meaningful interpretation and concluding statements which forms the basis for the programme.

This phase involved the conceptualisation of the findings from the empirical phase. The findings were conceptualised within the framework of Dickoff, James and Wiedenbach (1968) elements of practice theory namely the context, agent, recipient, dynamic, purpose and procedure. Literature was explored for existing frameworks of critical thinking in order to support or refute the empirical findings as to how critical thinking can be facilitated in teaching and learning. Dickoff, James and Wiedenbach (1968: 428) refers to the context as the setting, location, time space or structure that constitutes different elements of the situation in which the activity occurs. In this study the context is divided into three levels, namely the macro, meso and micro levels which also included an institution of higher education as part of the context.

According to Dickoff, James and Wiedenbach's practice theory (1968: 425) the agent is a person that carries out the activity. The nature of the agent stimulates activities that are facilitative of goal achievement. The agent in this study is the nurse educator who had to exhibit certain attributes and dispositions/traits that enabled them to facilitate the critical thinking skills of the learners.

The recipient according to Dickoff, James and Wiedenbach (1968: 427) is any person or object that is the receiver of the activity by the agent. However, the recipient is not passive as the activity always stimulates a reaction. The recipient in this study is learner whose critical thinking skills is to be facilitated by the educator through the developed programme. Conceptualisation assisted the researcher in identifying the characteristics of the learner whose critical thinking is to be facilitated.

Dickoff, James and Wiedenbach (1968: 431) purport that the dynamic comprises of the vivacity of influence as an energy origin and an attribute associated with capacity to execute activities. The possible functioning could be physical, physiological or psychological and is relevant only to persons functioning as agent, recipient or within the context. It further refers to the driving force behind the facilitation of the learners' critical thinking. The dynamic in this study is interactive dialectical dialogue that takes place between the nurse educators and the learners in a quest to facilitate the critical thinking skills of the learners.

Dickoff, James and Wiedenbach (1968) assert that the procedure refers to features along a path and/or emphasis of steps, instructions or patterns on how the activity is to be performed. They further state that the procedure includes principles, sets of rules or particular features that contribute to a series of actions aimed at the goal that is to the advantage of the recipient.

The goal is referred to as the terminus. It is seen as representing the point of accomplishment of the activity. The goal is further said to be having a unifying characteristic of all activities that are achievable through the activity so that the agent visualizes the end product in their actions. This visualization enables the agent to consider how best to perform the activity in order to reach the goal (Dickoff, James & Wiedenbach, 1968: 428-430). The goal of this study is to develop, implement and evaluate a programme to facilitate critical thinking in nursing education.

2.3.3 PHASE 3: The development of the programme using the integrated framework

The purpose of this phase was to develop a programme to facilitate the critical thinking of 1st year learners in the B.Cur programme in an institution of higher education. A literature study of the components of the programme was made to give direction as to how a programme to facilitate critical thinking could be developed

An integrated framework was derived from the frameworks of Beyer (1988), Bevis (1989) and Caffarella (2002), and this framework informed the steps in the programme development, namely the context, structure, process and outcomes. Beyer's framework of programme development is based on the setting and building rationale, structuring the programme- integrating content, selecting skills and strategies to be included in the programme, defining in detail the attributes of skills and strategies, selecting appropriate teaching strategies, providing training material and environment needed for implementation of the programme, providing support and assessment needed to ensure continuation of the programme, defining thinking, its key components and their interrelationship and lastly continuously revising the programme.

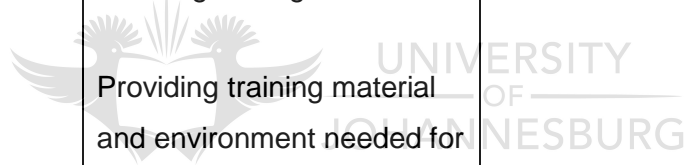
On the other hand Bevis' framework of programme development consists of the setting, philosophical framework, the knowledge compound, learning strategies and measuring achievement, organizing and evaluating change and curriculum vivification. Caffarella's framework for programme development is based on identifying personal beliefs related to programme development, identifying programme goals, developing programme objectives, designing instructional plans, formulating evaluation plans and making recommendations and communicating results.

Through the synthesis of the three frameworks the integrated framework was developed as indicated on table 2.1 through a deductive process.

TABLE 2.1: FRAMEWORK FOR PROGRAMME DEVELOPMENT

BEVIS (1989)	BEYER (1988)	CAFFARELLA (2002)	INTEGRATED FRAMEWORK
Setting.	Setting and building rationale.		CONTEXT The environment for critical thinking facilitation (Facione 1990).
Philosophical framework.		Identify personal beliefs related to programme development. Identify programme goals. Developing programme objectives.	STRUCTURE Philosophical foundation of the programme. Programme goal/outcomes.
The knowledge compound.	Structuring the programme-integrate into the content.		Content

<p>Learning strategies and measuring achievement.</p>	<p>Selecting skills and strategies to be included in the programme.</p>	<p>Design instructional plans.</p>	<p>PROCESS</p> <p>Method of facilitating critical thinking.</p> <ul style="list-style-type: none"> - Teaching and learning strategies for critical thinking.
<p>Organising and evaluating change.</p>	<p>Define in detail the attributes of the skills and strategies.</p> <p>Selecting appropriate teaching strategies.</p> <p>Providing training material and environment needed for implementation of the programme.</p> <p>Providing support and assessment needed to ensure continuation of the programme.</p> <p>Defining thinking, its key components and their interrelationships.</p>	<p>Formulate evaluation plans.</p>	<p>Assessment of critical thinking.</p>



			OUTCOMES
Curriculum vivification.	Continuously revising the programme.	Making recommendations and communicating results.	Programme outcomes.

The methodology for the implementation and evaluation of the developed programme is described under phase four of the study.

2.3.4 PHASE 4: Programme implementation and evaluation

The objective of this phase was to describe the implementation and evaluation of the developed programme.

2.3.4.1 Programme Implementation

The programme was implemented over a term, which is equivalent to 12 academic weeks. The philosophical foundation of this programme was grounded in the constructivistic worldview. The nature of the knowledge/content that was given in relation to the facilitation of the learners' critical thinking skills was considered.

The accessible population (Burns & Grove, 2009: 355) was all the B.Cur learners registered with the SANC in an institution of higher education under study. A purposive and convenient sampling method was used (Burns & Grove, 2009: 353). The programme was implemented on 50 first year B.Cur learners whom the researcher was teaching. A pre-briefing session was conducted to provide an outline of the study to the learners before the implementation of the programme after which the learners gave informed written consent to participate in the implementation of the programme.

The programme was implemented as the educator (researcher) and the 1st year B.Cur learners interacted in the learning environment of the higher education institution in a manner that was collaborative using the quest to facilitate the learners' critical thinking.

The interaction was one of co-operation using the dialogical and dialectic teaching/learning approaches and adult learning principles that facilitate critical thinking. The researcher used the paper-case scenario approach that would cover the content of the Basic Emergency Care using the critical thinking process according to the findings which were based on the formulated conceptual framework, namely reflection, Socratic inquiry, argumentation, and the dialectical dialogic reasoning approach to teaching. A paper case scenario was formulated based on the identified methodologies whose level of complexity was increased with the complex nature of the learning outcome. The researcher formulated six learning outcomes of which the first two were not based on the identified methodologies but were rather aimed at testing the learners' prior knowledge which formed the basis of the content that was taught. The content that was taught was Asphyxia and Pulmonary oedema which formed part of the Basic Emergency Care module. Each learning outcome was reached using a teaching strategy that required reflection, Socratic enquiry, argumentation and dialectical dialogic reasoning.

2.3.4.2 Programme evaluation

The purpose of this stage is to explore and describe the experiences of the learners regarding the implemented programme. Not all the learners participated in the evaluation of the programme. Based on their willingness to participate, the learners were requested to give immediate feedback on how they experienced the use of each methodology after lesson presentation. The learners were also requested to give consent for the use of an audio tape recorder to record the interviews.

The researcher used a purposive and convenience sample (Burns & Grove, 2009: 353). The sample was convenient in that the 1st year programme was continuing. The learners who consented to participate in the evaluation of the implemented programme were requested to form focus groups. Four focus groups based on the last four learning outcomes that were based on the selected four methodologies were conducted.

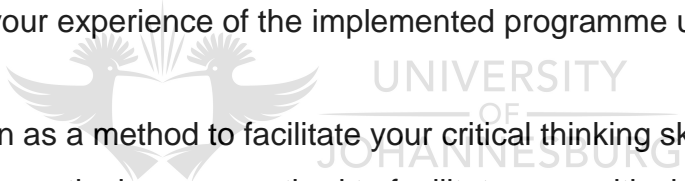
The sample consisted of predominantly Black learners whom English was their second language. There were 37 females and 9 males whose ages ranged from 17-32 years. The focus group interviews were conducted by the researcher in the classroom with each lasting for 30-45 minutes.

The researcher ensured that the classroom was free from noise and distraction. The first focus group consisted of 12 learners whose focus was on the third learning outcome that used the reflective process as a methodology to facilitate critical thinking lasted for 30 minutes.

The next focus group which gave feedback on the fourth learning outcome which focused on the use of Socratic enquiry as a methodological process to facilitate critical thinking consisted of 15 learners as participants and lasted for 40 minutes. The third focus group consisted of 10 learners as participants who gave feedback on the use of argumentation as a methodological process to facilitate critical thinking evaluated the fifth learning outcome and lasted for 35 minutes.

The fourth focus group which was focusing on the last learning outcome which used dialectical dialogic reasoning as a methodological process to facilitate critical thinking was made up of 9 learners and lasted for 45 minutes. Questions relevant to each methodological process were asked.

Please tell me your experience of the implemented programme using the:

- 
- Reflection as a method to facilitate your critical thinking skills.
 - Socratic questioning as a method to facilitate your critical thinking.
 - Argumentation as a method to facilitate your critical thinking.
 - Dialectical dialogic reasoning as a method to facilitate your critical thinking.

The researcher used interviewing skills of probing, paraphrasing and summarizing to elicit in-depth experiences of the learners until data saturation. During the focus group interviews the researcher also made use of an audio tape recorder for accurate recording of data and took field notes to enrich the data.

Content analysis was used as a data analysis method (Burns & Grove, 2009: 528). The researcher read through the interviews several times after each focus group and verbatim transcriptions were done. The researcher made use of inductive reasoning, deduction, inference and derivation from the analysed data, and synthesised to form themes. The common words and patterns about the learners' experience of each methodology were underlined, extracted and indicated in the summary for each methodology.

Based on the results, concluding statements and recommendations were made. To ensure credibility of this stage the researcher made use of an independent coder to analyse the collected data. Following analysis the researcher held a consensus meeting with the independent coder to agree on the identified themes and common patterns.

The researcher also went back to the learners to verify the identified themes and common patterns. Furthermore to ensure credibility of this stage the researcher gave a detailed description of how the programme was implemented and evaluated.

2.4 SUMMARY

The research design and methods are described in this chapter. The design was qualitative, descriptive, exploratory and contextual in nature for programme development. Phase one focused on the empirical phase whereby a selected sample of nurse educators were interviewed on how the framework of critical thinking can be used to facilitate critical thinking of learners.

Phase two of the study involved conceptualisation of the empirical findings from phase one of the study. The programme was developed in phase three of the study, and the fourth phase involved implementation and evaluation of the programme. The findings of the empirical phase of the study are described in Chapter 3.

DESCRIPTION OF FINDINGS

3.1 INTRODUCTION

This chapter involves the description of findings from the empirical data collected through focus group interviews of nurse educators. The collected data was analysed using Miles and Huberman's matrices. Lincoln and Guba's strategies were used to ensure trustworthiness. The purpose of this study is to develop, implement and evaluate a programme to facilitate critical thinking in nursing education. The critical thinking framework as described by Facione (1990) was used to direct data collection regarding how critical thinking should be facilitated. The framework includes the description of contextual, conceptual, methodological, evidential, and criteriological aspects in facilitating critical thinking. The educators' citations will be highlighted in italics.

3.2 DESCRIPTION OF FINDINGS

The perceptions of the nurse educators regarding how critical thinking can be facilitated in nursing education using the critical thinking framework are depicted in table 3.1. Findings are described in accordance with Table 3.1 with components of the critical thinking framework as themes, and the perceptions of the participants as categories and sub-categories.

The participants were requested to respond to the following research question:

- How can a programme to facilitate critical thinking in nursing education be developed using the critical thinking framework namely the context, conceptual, methodological, evidential and criteriological dimensions of critical thinking?

Probing was done to collect in-depth perceptions of nurse educators regarding how critical thinking can be facilitated in clinical nursing education, until data saturation under each component was reached.

TABLE 3.1: PERCEPTIONS OF NURSE EDUCATORS REGARDING HOW CRITICAL THINKING CAN BE FACILITATED IN NURSING EDUCATION

THEME FROM CT FRAMEWORK	CATEGORIES FROM PARTICIPANTS	SUBCATEGORIES
CONTEXTUAL DIMENSION	<ul style="list-style-type: none"> • Use of legislation that fosters critical thinking. • Follow philosophy guiding critical thinking. • Create a context that enables the facilitation of critical thinking. 	<ul style="list-style-type: none"> • Openness and fair-mindedness • Willingness to listen • Freedom for creativity • Trust • Curiosity • Confidence • Integrity
CONCEPTUAL DIMENSION	<ul style="list-style-type: none"> • Acquisition of conceptual knowledge as a basis to facilitate critical thinking. • Use of language for understanding. • Acquisition of foundational knowledge. • Use of pre-existing experience to connect to new knowledge. • Use of interdisciplinary knowledge. 	
METHODOLOGICAL DIMENSION	<ul style="list-style-type: none"> • Use of problem-solving and decision-making skills. • Use of debate and argumentation. • Promote the use of dialectic dialogic, deductive and inductive reasoning. 	

	<ul style="list-style-type: none"> • Use of collaboration and cooperation skills. • Use of reflection as a basis for learning. • Use of questioning and understanding. 	
EVIDENTIAL DIMENSION	<ul style="list-style-type: none"> • Investigate to determine facts. • Justify reasoning. • Provide a trail of evidence to strengthen facts 	
CRITERIOLOGICAL DIMENSION	<p>Arguments should demonstrate the following:</p> <ul style="list-style-type: none"> • Logical coherence • Clarity • Completeness/holistic • Depth • Relevance • Breadth 	

3.2.1 Contextual dimension

According to the critical thinking framework, critical thinking does not happen in a vacuum. It is thinking that is context-bound and is influenced by the context within which it occurs. The participants were asked to respond to the following question regarding the contextual dimension of critical thinking:

- How does the context influence the facilitation of critical thinking skills of the learners in nursing education?

All the participants indicated the importance of the context in the facilitation of critical thinking. Three categories emerged from their responses namely, the use of legislation that foster critical thinking, the philosophy guiding the facilitation of critical thinking and the creation of a context that facilitate critical thinking with its sub-categories as the following values, openness, willingness to listen, freedom for creativity, trust, curiosity, fair-mindedness, confidence, and integrity.

3.2.1.1 The use of legislation that foster critical thinking

The nurse educators believed that it is important to ensure that the context in which critical thinking is facilitated is conducive to such thinking, and that national and professional legislative frameworks that govern nursing education form one of the contextual aspects they consider when facilitating critical thinking of the learners.

One educator said, *“Legislative frameworks that impact on nursing education are part of the contextual considerations. We cannot teach nurse outside Regulation 425 which outline the minimum requirements for the education and training of a nurse (general, psychiatric, community) and midwife registration. The guiding legislation gives direction to the provision of the curriculum for the education and training of nurses and puts emphasis on the facilitation of critical thinking”*.

“Yes one of the critical cross-field outcomes stipulated by the South African Qualifications Act 58 of 1995 and the National Qualifications Framework (NQF) is that the graduates from learning programmes should be able to think critically. The learners should use their critical thinking to make meaningful decisions and solve problems in practice”, said one educator.

“The legislation guiding nursing education stipulates that it is envisaged that the product of a nursing programme will be a critically thinking practitioner who will be able to use these skills in practice” added another in agreement.

The legislative framework stipulates what the educational context should be like.

“Everything that is taught should be in line with the legislative prescripts, the countries health needs and what practice requires” said another.

Legislative prescripts stipulate what the nursing education environment should be like.

“The SANC requires that on completion, the nursing graduates must be able to take responsibility and accountability for their practice, but such practitioners are those that have critical thinking skills, which means the context must be such that it is conducive for the learners to develop such thinking” responded another

‘I agree with you, according to the Nursing Act professional nurses should be able to use critical thinking skills in order to make meaningful decisions and solve problems’, added another educator.

“One educator said, “The nurse educator needs to create opportunities that call on the learners to apply their clinical knowledge using their facilitated critical thinking skills”.

“Yes such opportunities are created through, for instance, giving the learner an opportunity to solve complex problems that will force them to use critical thinking to solve such problems” said one educator.

“The NQF stipulates that teaching and learning should be at a level that will enable the learners to think critically. According to SAQA the educator should create a learning environment that is conducive for the learners to use their critical thinking skills to apply their knowledge solve problems”, said another in support of the other.

“The educator needs to formulate ill-defined problems that will provide a context for the learners to apply their facilitated critical thinking skills to solve problems in practice. SAQA refers to the demonstration of applied competencies that include foundational, practical and reflexive competencies”, said one of the educators (nodding).

“According to R425 the learning context should be such that it enables the learners to apply their critical thinking through their interaction with the multi-disciplinary health team”, said another educator. *“Yes, and again the context needs to be such that the focus is on the learner and not on the educator”* said one in agreement.

One educator said, *“I also think an outcomes-based learning environment enables the facilitation of critical thinking because it is learner-centred and result oriented. Therefore a focus on desired outcomes as happening in outcomes-based education will enable the educator to facilitate critical thinking skills of learners”*.

The objective is to facilitate the critical thinking of the learners, the educator needs to take a back seat, create a learning environment that encourages the learner to be in the forefront of learning, while being allowed to enhance their critical thinking skills.

3.2.1.2 Philosophy that guides the facilitation of critical thinking.

The participants cited a philosophy guiding the education and training in nursing in South Africa as an important aspect of the context in which the learners' critical thinking can be facilitated. The philosophy of the regulatory body, the learning institution, including the individual philosophies of both the educator and the learner, shapes the environment in which the learners' critical thinking is facilitated as cited.

“The philosophy of the South African Nursing Council is that nursing programmes should develop the learners' ability in relation to critical thinking. The programme should develop the learner's ability in relation to analytical, critical, evaluative, and creative thinking, and continuously stimulate their capacity to interpret scientific data for nursing actions to draw conclusions and exercise independent judgment”, remarked one of the educators.

“Yes definitely, for instance the philosophy of this institution is learning to ‘be’ and not learning ‘about’, because if you are learning about, you rote learn and there is no critical thinking in rote learning”, said one educator.

“The educator's individual philosophy of teaching is also important because I will not be able to facilitate critical thinking if I do not believe in this kind of thinking” said another in agreement.

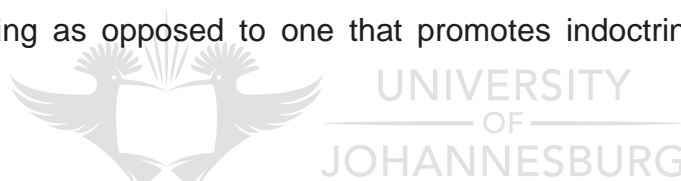
“A constructivistic philosophy is an example of a philosophy that is supportive of the development of critical thinking”, cited one educator.

“If the learners are to develop critical thinking skills, the educator should create a classroom environment that allows them to create their own knowledge, because we cannot assume that they don’t have knowledge when they come into nursing. They come with a wealth of knowledge both from personal and work experience that can be used to create new knowledge since critical thinking cannot be facilitated in a vacuum”, added another.

Another educator said, *“The philosophy used must be such that it support ideas and allows the learners to develop in the learner’s own mind”.*

“The learners should be given related and supportive activities; where taking risks and generation of new knowledge are encouraged”, added another educator.

A philosophy that allows for freedom in the learning context is supportive of the facilitation of critical thinking as opposed to one that promotes indoctrination that stifles critical thinking.



3.2.1.3 Context that enables the facilitation of critical thinking

The values that were identified as being supportive of a context that enables the facilitation of critical thinking were open-mindedness and fair-mindedness, willingness to listen, freedom for creativity, trust, curiosity, confidence and integrity.

➤ *Open-mindedness and fair-mindedness*

Open-mindedness and fair-mindedness go hand in hand. An open-minded person usually maintains a degree of fair-mindedness in their thinking. The participants cited open-mindedness and fair-mindedness as important aspects of the context that enables the facilitation of critical thinking. The following were their responses:

“My attitude should be one of openness in order to allow for the learners to think critically. The learners should be allowed to voice their ideas and I should not shut them down” said one educator (gesticulating with hands).

Another educator said in support, *“Yes the learners must also be encouraged to maintain an attitude of openness as well and allow fellow learners to question and argue out their ideas”*.

“The learning context is “safe” and facilitates critical thinking when the learners freely share their feelings and thoughts without the fear of being ridiculed. Open-mindedness allows the learners a context where they feel safe to explore ideas without being over-cautious and self-cautious”, added another.

“Some learners can put you in a corner by asking challenging questions, so as an educator you should maintain an attitude of open-mindedness and not be afraid of challenge” said one educator almost laughing.

“Actually in my class I encourage the learners to challenge what I say and challenge each other without the fear of victimisation or reprimand” added another.

“A mind that is open is a mind that is prepared to be persuaded otherwise, and a learning context that allows for such value provides a “fertile ground” for the facilitation and development of critical thinking skills”, added another.

“Open-mindedness is important because it allows me to create an environment where my relationship with the learner is that of partnership which helps with the facilitation of their critical thinking”, said another educator.

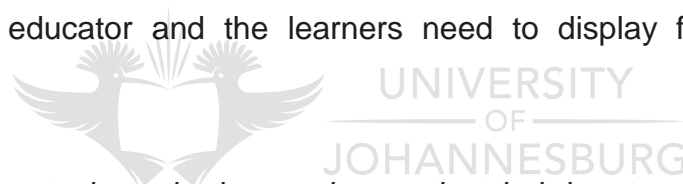
“When the learners are treated as partners they take ownership and responsibility for their learning, and where relationships are open critical thinking is possible” said one educator in support.

“In my class I know that I don’t have all the knowledge and I acknowledge the fact that I can learn from my learners, therefore I always maintain an open-mind and create opportunities for them to voice their experiences and what they know” said another (smiling).

“The educator must be open to learn from the learners. Being open to learning from the learners allows the classroom context to be one where the educator and the learners feel at ease to make mistakes and explore different kind of learning and strategies without being made to feel inadequate and stupid” added another.

Another educator said, *“Yes a context where a partnership between the educator and the learners exists provides an environment where there is co-learning and co-ownership of the learning that takes place without the other feeling superior to others”*.

The participants cited that a context where fairness is practised is usually a psychologically safe place. If the learners’ critical thinking is to be facilitated effectively, then both the educator and the learners need to display fair-mindedness in their interaction.



“In an environment where the learner knows that their inputs will not be taken seriously and treated fair-mindedly, they become scared to voice their opinions and that stifles their critical thinking” said one educator.

Another educator said, *“Fair-mindedness is an important value, especially in a learning area where the point of view of others is treated respectfully and there is tolerance of the opinions of others”*.

“A learning area where the learners are treated fairly as important participants in the teaching/learning transaction, they freely engage in deliberations without fear of prejudice or bias. I always encourage the learners to feel free to engage in the discussion because in an environment where there is sensitivity towards the opinions of others the facilitation of critical thinking is possible” said one educator.

In this context the learners are not scared to voice their opinions or to differ with others because they know their views will be treated fairly. They talk freely in the knowledge that there is no prejudice or bias on the part of the educator and fellow learners in judging their views, because they are considered to be partners in the learning process.

➤ *Willingness to listen*

The educators also cited willingness to listen as another vital aspect of an enabling context for critical thinking.

One educator said *“As the educator you have to display an attitude of willingness to listen to the learners, be willing to engage them and not to shut them down. The educator should acknowledge the fact that they don’t know everything, therefore they must listen to the learners”*.

“The learners need to be encouraged to listen to one another as well, because listening allows for the critical thinker to engage with information and think carefully about it” said another in agreement.

Another educator said, *“Being willing to listen to the learners teaches them that for one to be able to think critically, one needs to be willing to listen to others. The learners also learn that intellectual arrogance stifles critical thinking because it tends to steer them towards thinking that their opinions are the only opinions that matter”*.

“The learners’ points of view and opinions cannot be seen as irrelevant and unimportant, therefore I maintain an attitude of willingness to listen to them. It cannot be a matter of I speak and the learners listen because that will prevent them from thinking critically” said another educator (smiling).

“Of course, if the learners see that the educator is willing to listen to their opinions they also develop a willingness to listen to others” added another.

One educator said, *“The educator should acknowledge the points of view of the learners, and in their responses they should demonstrate that they were listening to them”*.

“I have learned over the years of teaching that in a teaching-learning environment where the educator listens to the learners, the learners also adopt an attitude of willingness to listen to others”, said one of the educators (smiling).

“An attitude of unwillingness to listen prevents active participation and stifles critical thinking. Over the years of my teaching experience I have learned that where listening is not the norm, people tend to jump to conclusions and there is usually no critical thinking taking place in that environment”, added another.

One educator said in agreement, *“Yes in a learning environment where the learners are encouraged to listen and where they see that the educator is listening, the learners learn not to jump to conclusions, but instead to carefully consider what is said by others before they voice their own opinions”.*

➤ *Freedom for creativity*

The participants also cited an environment that allows for freedom for creativity as an important part of the context that will enable the learners to think critically.

“The educator should allow freedom for creativity. The learners need to be made aware that they can voice their ideas, and should be made to feel free to be as creative as they can be without fear of being judged, ridiculed or humiliated”, said one educator.

“In a learning environment where the learners are cautious of using their creativity, critical thinking is also hampered”, added another (nodding).

Another educator said, *“I allow my learners to use their creativity to direct their learning, because one cannot expect that they will think critically if one does not allow them to use their creativity in the learning area”* added another in agreement.

“Therefore, the educator needs to ensure that the learners are encouraged to use their creativity independently to solve problems. This freedom for creativity allows for the use of multidimensional and multidisciplinary use of knowledge to solve clinical problems”, added another in agreement.

One educator said, *“An environment where the learners are “shut down” when they try to use their creativity prevents them from thinking critically”*.

“I usually encourage my learners to actively question issues in class and encourage their independent engagement with the learning task while they individually and collectively create their own meaning through the use of their creativity”, added another.

“I also think it is important to let the learners use their creativity to “figure out” ideas during interaction with others and come up with conclusions formulated through their own independent thinking that is not influenced by what is going on around them” said one educator.

Freedom to be creative in one’s thinking about issues provides an environment, both physical and mental, that is conducive to facilitating critical thinking. An environment where creativity is not suppressed favours the facilitation of critical thinking in learners, because they get given an opportunity to use their imagination and apply their creative thinking to critically analyse issues and make judgments.

➤ *Trust*



The educators further cited trust as an important aspect of the learning environment.

One educator said *“Where there is trust the learners will feel free to engage in discussions, arguments, and sharing of ideas without fear of being judged. They will know that it is “ok” to make mistakes”*.

“I agree that an environment where there is trust the learners understand that they can challenge their own thinking and that of others, with the teacher included, without fear of victimisation” said another educator (nodding head).

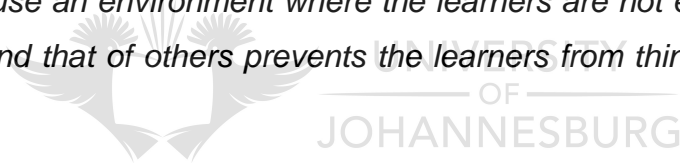
Trust in the learning area allows the learners to venture into unexplored physical and cognitive territories, knowing that their opinions will be treated in an empathetic manner.

“It is important that the educator creates an environment of mutual trust in the classroom so that the learners can trust their reasoning and thinking to participate actively in the learning area and construct their own knowledge, as their critical thinking skills are facilitated”, added another.

One educator said in addition, *“In a learning environment where there is no trust, the learners are afraid of being vocal, thereby suppressing their critical thinking”*.

One educator said, *“I agree, in a learning environment where there is mutual trust between the educator and the learners, and between the learners themselves, learners have the assurance that they can freely participate in the learning process and also trust that their viewpoints will be considered and taken seriously by others without bias or prejudice. The learners are given equal opportunities to speak out and share their experiences and opinions”*.

“I always ensure that all learners have an opportunity to voice their opinion, including the quiet one because an environment where the learners are not encouraged to trust their own opinions and that of others prevents the learners from thinking critically”, said one educator.



A high level of trust, commitment, and the democratic exchange of ideas creates a learning environment that facilitates critical thinking. Therefore the educator is obliged to create an environment that is built on mutual trust between themselves and the learners, and between the learners.

➤ *Curiosity*

According to the participants another value that was seen to be important was one that evokes the learners' curiosity. The participants cited that:

“It is important that the learning environment creates an eagerness to learn on the part of the learners. They need to have passion for wanting to know more and have a probing mind to want to go deeper into the information at hand” said one of the educators.

“It is however important that they are allowed freedom to satisfy their curiosity in the learning area without fear that they will be shut down or that the educator will show irritation” added another.

Another educator added that, *“the educator needs to create learning opportunities that stimulate the learners’ curiosity. The learning environment should stimulate the learners’ inquisitiveness and motivate them to want to go beyond what is on the surface”*.

“An environment that encourages the curiosity of the learner is one needed for the facilitation of critical thinking, which is why I always ensure that the learners’ eagerness to want to know more is maintained by giving them thought-provoking tasks” said one educator.

“I believe the learners should be given challenge-filled tasks that will force them to dig deeper into issues and encourage their inquisitiveness, because critical thinkers are curious, they always want to know more” added another.

“Curiosity provides an opportunity to facilitate critical thinking, in that the learners are forced to always look for more information before they can come to any conclusion. Critical thinkers do not take things for granted, but they always search for more information before they conclude”, said another.

“In a learning area where curiosity is encouraged and promoted, the learners tend to be deep holistic learners, and with deep holistic learning critical thinking is facilitated” said one educator.

“Yes, superficial learners are not curious, and will not think critically in return, but it is the educator’s responsibility to awaken the learner’s curiosity by creating an environment that is conducive” added another (nodding).

Learners who interact with the learning task in a deep holistic manner are inclined to be curious, and as such will be cognitively ready to have their critical thinking facilitated. Superficial learners tend to rote learn and have lack of a curious spirit thus preventing the facilitation of critical thinking.

Therefore the educator is obliged to create a mental and physical context that stimulates the learners' curiosity if their critical thinking is to be facilitated.

➤ *Confidence*

It was the participants' opinion that an environment where an individual's confidence is enhanced is supportive of facilitating critical thinking and such individuals easily engage in conversations or act without the fear that they might be judged and made to feel stupid.

"The educator has a responsibility of ensuring that the learners' confidence is enhanced, because if they are confident they tend to interact openly and freely with an understanding that they too may be wrong, and are usually free to reconsider their stance in an argument" said one educator.

"Confidence helps the learner not to shy away from robust debate in the learning area while keeping in check their own thinking patterns" said another in agreement.

The learners should be afforded an opportunity to freely debate issues and arrive at their own conclusions.



"It is important that the learning environment is conducive to the building up of the learner's self-confidence. I believe that a self-confident learner will be inclined to think critically because they are not afraid to differ with everybody else" emphasised another.

"Yes a learner who is self-confident believes in their thinking capabilities and that of others" said another in agreement.

One educator, *"A learning area where the learners' self-confidence is not enhanced is not conducive to facilitating critical thinking because the learners tend to doubt their thinking capacity, stop thinking and rather rote learn their way through the task at hand"*.

“It is true there are disadvantages, a learning area where the learners’ confidence is not enhanced, those learners’ critical thinking is stifled and they are usually scared to say what their point of view is because of their lack of self-confidence” said one of the educators.

The educator has an obligation to ensure that the learning environment enhances self-confidence. The learners that seem to be lacking confidence should be treated in a manner that will not “break” them, but make them aware that they can expand their thinking skills, and that they feel secure that challenging their thinking skills and logic will be done in an empathetic manner. The learners’ self-esteem should always be enhanced.

➤ *Integrity*

The educators also cited integrity as an important aspect of the enabling context for the facilitation of critical thinking.

“Integrity is necessary in that an environment where one knows that the person they interact with is consistent in their behaviour and thinking, is an environment conducive for critical thinking” said one educator.

“Yes, I agree with my colleague because one cannot be seen to be changing their stance all the time, therefore it is essential to have integrity if we are to facilitate critical thinking” added another (smiling).

“The educator should also be seen to be a person of integrity. They cannot be seen to say something and do something different, including their thinking. What I mean is that their interaction needs to be one that enhances the integrity of the learners as well,” said another.

“It is true they have to maintain integrity in their thinking without being easily swayed and convinced otherwise” said another in agreement.

“Mental integrity involves maintaining a manner of thought that does not change according to what is going on around. In a context where there is integrity in thinking and behaviour, the learners also learn to maintain integrity in their thinking. Such an environment is conducive to the facilitation of the learners’ critical thinking. Therefore educator should create an environment where the learners are encouraged to identify and acknowledge flaws and lack of integrity in thinking and behaviour, and be supported to address them”, said another educator in conclusion.

3.2.2 Conceptual dimension

According to the critical thinking framework, thinking also takes place in concepts. When one thinks they draw from their pre-existing conceptions of the world that has been formulated in their minds. Conceptual aspects of critical thinking are based on the knowledge that has been constructed and stored in the thinker’s mind. Concepts are used to formulate statements, principles, and theories, and these form the knowledge drawn from, during the process of critical thinking.

The respondents in this study cited the acquisition of conceptual knowledge as a basis to facilitate critical thinking, the use of language for understanding, acquisition of foundational knowledge, use of pre-existing experience to connect to new knowledge and the use of interdisciplinary knowledge as the conceptual aspects of content that are considered during facilitation of the learners’ critical thinking.

The educators’ responses are described below.

3.2.2.1 The use of conceptual knowledge as a basis to facilitate critical thinking.

Conceptual knowledge refers to the learners’ representation of the major concepts in a system. According to the educators it is important to teach the learners concepts of a particular domain so that they can use the concepts as a frame of reference as their critical thinking is facilitated using the relevant contents. The educators responded to the following question in relation to the conceptual considerations:

- How can the conceptual dimensions of the content be used to facilitate the critical thinking of learners in nursing education?

“Concepts are the building blocks of conceptual knowledge therefore are important”, said one educator.

Another educator said, *“The learners have to be able to define the concepts of a particular content before you teach them the actual content. For instance in my domain such as intensive care, if I am going to teach cardiology, the learners must be able to understand and internalise concepts such as tachycardia, arrhythmias, bradycardia and dyspnoea otherwise they won’t be able to understand what I am going to teach with regard to cardiology”.*

“Yes they will use these concepts to reason out issues about a patient with a cardiac condition, but if the educator does not ensure that the learners have this conceptual knowledge, it will be difficult to facilitate their critical thinking during the presentation of the content”, responded another educator.

“It is also important that during the facilitation of their critical thinking the educator introduces them to critical thinking concepts like critically analysing, explaining, comparison and evaluation, because the application of this critical thinking vocabulary will help them to think critically” said another.

“When the learners understand and have internalised the relevant concepts, they will use these concepts to argue out and interpret what they observe from patients. For instance a learner who observes that a patient is cyanotic, has tachycardia and the oxygen saturation is low. This learner will be able to bring all these concepts together to think critically about them, by analysing, and looking at their relationship to each other, interpret and explain how they come about and justify their claims according to what they see. All of this involves critical thinking” added one of the educators.

Another educator said, *“Conceptual knowledge could also include concrete and abstract concepts. These conceptual considerations could be verbal concepts, which include classes of ideas or objects, or non-verbal concepts that the learners use to make a mental picture to represent the patient’s symptoms as they see them, and to do this they use conceptual knowledge that is stored in their memory.*

I agree with my colleague because during the facilitation of their critical thinking, the concepts stored in their minds can also help them to describe a process as they assess the relationship between the concepts that describe a process, for example the physiology of respiration, therefore it is important that during teaching I use methods that will make the learners use these concepts to think, if I want them to think critically. Conceptual knowledge on the part of the learners will also help to enable them to link whatever prior knowledge they have to the new, and construct knowledge for themselves through the use of their facilitated critical thinking” added another educator (nodding).

“Yes the educator needs to use strategies that will enable the learner to draw from their conceptual knowledge to connect their prior knowledge and experience that they may have gathered in the clinical setting to reason about the content at hand using their critical thinking skills. This will also enable them to identify new relations in the knowledge they are constructing, and to create new relations, which they may consider relevant to personal learning. It will increase the learners insight into the concepts dealt with, relations, increasing their understanding with the subject matter, and influencing the creation of meaningful knowledge of the content. If the strategy used by the educator is appropriate, the learners will be able to interpret information as they discover it, procedures and knowledge references that are related to the concepts under consideration”, said another educator.

Finally, the learner, through encouragement from the educator, adapt the patient clinical picture to their own conception, using their facilitated critical thinking skills” added another one in agreement.

3.2.2.2 *The use of language to understand.*

Language is an important aspect of critical thinking. It is important to use thoughtful language to get the learners to think critically. The participants cited that language in the learning area should be one that encourages thinking.

“I teach a diverse group of learners from different language backgrounds. We normally say black learners are the ones that struggle with English as they are not first language speakers and therefore tend to rote learn, but I have found that this also applies to my Afrikaans speaking learners. These learners, instead of thinking critically about what they are taught, spend time trying to translate what you say into their languages, and end up getting frustrated, and to get through the work they just rote learn and regurgitate it during tests and exams. So what I do with my novice learners I use simplified English that will allow them to think critically rather than spending time on translation” said one educator.

It is different with my learners, the language I use with them is more advanced, as they bring experience from the workplace into the learning area, and because they have been exposed to the language of thinking and nursing vocabulary before. For instance during their basic training, I normally use language that will force them to think right away, in order to get their critical thinking facilitated” said another educator.

“It is also important that the educator ensures that the learners have an understanding of the nursing vocabulary, so that when I use the language used in the profession, the learners understand and they can draw from the relevant conceptual knowledge that is used in the branch of the profession to critically reason out issues and respond in a language understood in the profession. Without the understanding of the nursing vocabulary it might just be difficult to facilitate the learners’ critical thinking because they will not understand the language I am using in the learning area” added another.

“I agree with my colleague, through language the learners learn different concepts that they use to make inferences about patient experiences they may face in the clinical setting” said another in agreement.

One educator said, *“Language is a tool of thought and is central to the facilitation of critical thinking. Therefore the educator should acknowledge its value and build on the different language backgrounds the learners bring to class.*

The learners should be allowed to express themselves in order to better understanding some aspects of the learning material in their language, which is why if a need arises I sometimes explain things in the learner’s language so as to get them to engage with the subject matter using their critical thinking skills better. I do this in group work and I have since discovered that the learners tend to think critically if you do this. It is therefore important that while we want to cover content and at the same time facilitate critical thinking, we should also appreciate and accommodate language diversities as educators”.

Another added that, *“I also try and use a lot of group work in my class so as to improve language proficiency among my learners, and ask questions that stimulate thinking. So you will find that there is a lot of talking in my class, in that way the learners’ critical thinking is facilitated”.*

“The learners should also be given topics to research and come back and present in class. I use methods such as talk shows to help them with language proficiency and thereby facilitate their critical thinking skills. Language can be a barrier and an enhancer of critical thinking” cited another educator.

“It is important that the methods we use in the classroom help the learner to use language to make mental pictures of what they are thinking of, and to explain their feelings and experiences which will facilitate their critical thinking skills. The learning activities should be such that they use language to form ideas, shape and influence their critical thinking” said another.

3.2.2.3 Acquisition of foundational knowledge.

Foundational knowledge is knowledge that is required to be in place before teaching a particular content. It is used to draw inferences from, deduce, or move inductively from, in order to draw conclusions about the issue at hand.

The educators cited the importance of this knowledge in facilitating the learners' critical thinking because it forms a foundation on which they can build new knowledge (Gillespie and Paterson; 2009 164-170).

"I think it will be difficult for the learners to think critically about the subject if they don't have a frame of reference to refer to while thinking. This frame of reference is formed by the foundational knowledge such as anatomy and physiology. So it is important that I ensure they have the foundation before I deal with the more difficult stuff, for instance before I bring in patho-physiology. This knowledge will serve as an enabler for the educator to facilitate the learners' critical thinking" said another educator.

"The foundational knowledge serves as a 'springboard' from which they pull out concepts that they use to analyse, apply, and make sense of what is being taught, for instance in my pharmacology class the learners must have the foundational knowledge of physiology before I teach them about the effect of different drugs. They use this knowledge of normal physiology to reason out the effect of drugs to correct the abnormal physiology. Therefore I normally make sure that I use teaching methods that require them to go back to the foundational knowledge to construct new knowledge for themselves using critical thinking skills" added another in agreement.

3.2.2.4 Use of pre-existing experience to connect to new knowledge.

In response one of the educators said, *"I find that using experiential learning helps the learners to think critically. Exposing them to a particular clinical experience also helps them to have a knowledge base to draw from when they come across a similar case in the clinical area in future. So what I do is use experiential learning and a lot of practical examples in studying a case, where they see the patient with a particular disease and in the process of conceptualising the disease process, they present the case in class and I subsequently ask questions that force them to think critically"*.

“Yes experience gives them an opportunity to conceptualise events and ideas about the patient using logic and critical thinking to understand health problems” added another.

“Through experience in the clinical setting the learners also learn concepts that they later use as a frame of reference when reasoning about patient issues. For instance, they will learn and internalise concepts such as pyrexia, tachycardia, and dyspnoea. Not only do they learn these concepts but they experience them as they see the manifestations on the patients that are under their care” said another.

“The experience the learners are exposed to in the learning area must be such that it affords them an experience of the real world so that they can form from it a conceptual framework that they will use in future when there is need to make a reference. The educator should also not ignore the wealth of knowledge based on experience that the learners bring with to the learning area and should at all times refer them to it for use as they argue matters in the learning area” said another.

3.2.2.5 Use of interdisciplinary knowledge.

The educators also said that nursing education uses several related sciences from other disciplines in the facilitation of the learners' critical thinking.

One educator said, *“If you look at my domain which is intensive care nursing, you find that during the process of solving a clinical problem the learners will draw from other sciences to try and understand the patient's condition, to interpret symptoms or findings, for example blood gas analysis or an electrocardiogram, or even to justify their actions in trying to solve a patient's health problem. They use their knowledge of physiology, physical sciences, microbiology and medical science to analyse, interpret, and explain the content of nursing”*.

Another educator said, *“I constantly encourage the learners to use knowledge from other disciplines or domains. For an example, during the consideration of patient information, the learner whose critical thinking is facilitated also taps into their interdisciplinary knowledge by using concepts from these disciplines to make meaning of the content that is being discussed for an example, psychology, sociology and communication in a quest to have a holistic picture of the patient”*.

“I have since discovered that if I repeatedly expose my learners to interdisciplinary knowledge, they tend to learn to think critically. I model the interdisciplinary referencing as I think aloud about the subject matter, and through seeing me think in this fashion they understand and see how I use knowledge from other sciences to deal with patients’ health problems. They also learn to integrate their thinking within different domains and not think in silos” said another in agreement.

Another educator added that, *“Through the use of interdisciplinary knowledge, the learners are able to make meaningful connections within the variety of sciences that we borrow from in nursing, and this process involves critical thinking”*.

“I normally make sure that the methods I use to teach forces them to draw from other sciences, for example I will give them a multidimensional clinical problem to solve which will force them to integrate their insights from more than one discipline so as to demonstrate their understanding of the subject matter. What I want to see is how they integrate concepts and information from different disciplines to solve problems, for example, I could say they should assess and formulate a nursing diagnosis for a patient who presents with dyspnoea, tachycardia, oxygen saturation of 80% and cyanosis and give justification for their findings,” added another.

“The teaching method must be one that will also make the learners use interdisciplinary knowledge and methods that allow them to assess the acceptability of the knowledge in problem-solving and clinical decision-making using their facilitated critical thinking skills. So it is important that as an educator I use teaching strategies that also allow me to integrate new information from other disciplines so that there is ongoing construction of new knowledge by the learners” said another educator.

Another educator added that, *“The use of interdisciplinary knowledge is facilitative of critical thinking because it helps the learners to develop insight into the subject matter and problem-solving skills. I allow the learners to understand “what is” and the framework through which they arrive at “what then”. Learning and the development of critical thinking skills is promoted when the learners bring and share their pre-existing ideas in the learning area.*

During problem-solving, the learners identify insights from a number of disciplines for example biology and pharmacology that contribute to an understanding of the issue under discussion. The use of interdisciplinary knowledge further enhances the learners’ development of the ability to integrate concepts and ideas from these disciplines into a broader conceptual framework”.

“The use of interdisciplinary knowledge in the facilitation of critical thinking assists the learner to acquire the capacity to understand multiple viewpoints on a given topic. The learner gets to appreciate the differences between disciplines on how to approach a problem from multiple perspectives and applying discipline-specific rules regarding the evidence they have. This leads to a broader understanding of the issue under investigation” added that educator.

Interdisciplinary knowledge is used to integrate information and make meaning of what is being taught.

3.2.3 Methodological dimension

Methodological considerations refer to the “knowledge of how’ or “know how” to do things or the total set of means the critical thinker employs to consider arguments or to solve problems. It involves explanations of methods used to address the problem at hand (Mouton, 2009: 35). The methods include skills, cognitive operations, and knowledge of how to do things. The educators were asked the following question:

- How can the methodological dimensions be used to facilitate critical thinking in nursing education?

The respondents cited the use of problem-solving/decision-making skills, use of debate/argumentation, promotion of the use of deductive/inductive reasoning, use of collaboration/cooperation skills, use of reflection as a basis for learning and questioning and to determine understanding.

3.2.3.1 The use of problem-solving and decision-making skills.

The educators mentioned the use of problem-solving and decision-making skills as a method they use to facilitate the learners' critical thinking.

One educator said, *"I use a lot of problem-solving activities to get my learners to think critically. I would give a case scenario where they will first identify the problem, collect information about the problem, analyse the information, interpret what seem to be the cause of the problem and plan on how they are going to solve it. Through the use of their facilitated thinking skills they are encouraged to continuously judge whether they are in line, and give reasons for their actions. For instance, I will say a patient presents with difficulty in breathing, cyanosis and tachypnoea, and ask them to work through these symptoms to formulate a nursing diagnosis. So they would need to analyse each symptom to get down to the bottom of the problem in trying to understand the symptoms for them to make sense on how it comes about, and do the same with the others until they synthesise all the information to finally identify the problem"*.

"I agree with my colleague that the process of problem-solving is facilitative of critical thinking. If in your teaching you take the learners through the process of problem-solving and decision-making, they get to learn the critical thinking skills like analysis, interpretation, synthesising, and evaluation.

This will also help them to learn that in the process of thinking critically one may come up with a number of solutions, and they will also be required to weigh the solutions in their minds and pick out the most appropriate, and to do this they need to think critically. So it is important that we use teaching strategies that involve problem-solving and decision-making activities such as problem-based learning and case studies" said one of the educators.

“Here we teach adult learners and we know they have a lot of experience and prior knowledge, so giving them problem-solving activities facilitates their critical thinking in that they draw from their experience and prior knowledge as they work through the problems to get to a solution. They analyse the problem and apply their knowledge to come up with a solution” said another.

One educator said, *“Decision-making was also said to be another method that is used to facilitate critical thinking. The process of decision-making involves a number of critical thinking skills like assessing a number of alternatives, and choosing a course of action to address a health problem”*.

“Yes, what I do is that I give the learners a problem to solve and ensure that they come up with several alternatives to choose from to solve the problem. I ask them to analyse and evaluate the alternatives they generated during the problem-solving process. With probing questions I steer them towards classifying these alternatives according to priority, for example, if they have assessed a patient with a respiratory condition and have identified difficulty in breathing, cyanosis, pyrexia, and cough, they may make a clinical decision that they need to clear the airway, improve the breathing pattern, bring the temperature down, and manage the cough. So to trigger a discussion, I will ask a question where they will debate and argue about the data at hand, as well as analyse each solution and decide which problem to address first, for instance they may decide to address the difficulty in breathing as a priority before bringing the temperature down” said another.

“The use of problem-solving and decision-making processes forces the learner to identify the problem, and consider the data at their disposal. They will then evaluate their evidence using appropriate criteria and conceptual knowledge to make sense of it and draw conclusions. As they make meaning of the information, I ask questions that will compel them to consider the alternatives, clarify and justify the reasoning behind their choice of intervention, and reasons to support their decision” remarked another.

3.2.3.2 Use of debate and argumentation.

Debate was also cited as a method that is used by critical thinkers in order to get a better understanding of issues and what other people’s opinions are.

“I also use debate to get the learners to think critically in the learning area. For instance when they debate issues, they are forced to think about the issue at hand first before they present their opinions on the topic.

I find that this also gives me and their classmates the opportunity to question the learner about the thinking that went into their opinion formation, and in that way they get to think about their thinking skills and evaluate them before giving their explanation and justification.

Through debate the learners communicate with others and they are enabled to engage in in-depth analysis of the problem, while simultaneously comparing their point of view with that of others, and I believe this backwards and forwards consideration of the issue at hand forces the learners to think critically” said one of the educators.

“I usually give the learners a controversial topic to debate on in their groups. They work on the topic and come back and present in class, while the ones in the audience are asked to judge and evaluate what they say. They will then ask questions based on what was said. In the process the learners learn to avoid making claims without justification, so they will make sure that they need to use their knowledge to support what they say and learn to listen carefully to the opinions of others, evaluate them before they present their opinions’, which is part of critical thinking” said another in support.

“Yes I agree with you when you use debate, their reading comprehension, argument, evaluation of evidence, and summarising skills are enhanced, and thus the development of critical thinking skills. Alternatively the learners may be asked to prepare a logical argument on a particular topic, and I would encourage the other learners to listen actively to the different perspectives, differentiate between subjective and objective information, and to formulate their own opinions based on evidence” remarked another.

“Another example is that the learners can be given a treatment regime to debate about and defend. The learners are then asked to assess cost and benefit issues and make a decision. They can also use debate to outline their reasons for taking a certain position.

In the process they do not only have their critical thinking skills facilitated, but also use language to present their views, support fellow learners' views, disagree, and present an alternative view. It is also important that as an educator I encourage the learners to treat each other with respect during the debate, and eliminate competition and accept the opinions of others.

The use of debate in the learning area gives the learners, besides facilitating their critical thinking skills, an opportunity to use cognitive skills of analysing, logical reasoning, discriminating, predicting, and transforming knowledge. It also promotes self-confidence which is one of the dispositions for critical thinking” responded another educator.

Educators identified argumentation as another method used to facilitate critical thinking.

“The use of argumentation is another method that I encourage in the learning area to get the learners thinking critically as it ties in well with debate. For instance during the process of argumentation the learner is compelled to search for evidence be it from their prior knowledge, experience or literature to support their arguments. It also gives the fellow learners an opportunity to assess their colleague’s thinking and challenge areas where they identify flaws, while at the same time assessing their own as they also get challenged. In that way they learn not to take things for granted but to understand the point of view of others and evaluate them against their own while arguing for acceptance or rejection of their standpoint” one educator said.

Another educator said, *“I encourage my learners to argue things out using evidence-based information. So I normally send them to research and present their arguments to their fellow learners, while using evidence-based justification to back these arguments. The use of argumentation is important in the facilitation of the learners’ critical thinking, for instance in my class I would give the learners a case study where there is transgression of legislation with regard to medicines, and a group of learners are given an assignment to go and study the legislation that impacts on prescribing and dispensing of medication. Another group acts as judges while another group argue out what happened and provide evidence to support their arguments”*.

“Experience plays an important part in the facilitation of critical thinking. It is important that the educators should not forget that the learners bring a wealth of experience into the classroom. So when I teach I always encourage them to refer to their clinical experience to reason out what is being discussed and I use them to start a discussion. They will debate while at the same time using their clinical experiences as a frame of reference to justify their arguments. I find this to be facilitative of their critical thinking skills because they critically analyse, explain, and evaluate what others are saying as well their own responses”, added another.

Through argument the learners examine, interpret, and defend their standpoints, while at the same time reflecting on their views and those of fellow learners; however, the important thing is that the educator should ask relevant questions so as to take them through the process of thinking critically. Through their facilitated critical thinking the learners learn to listen to both sides of the story and eliminate narrow-mindedness, remarked another one”

3.2.3.3 Promote the use of deductive and inductive reasoning

“Critical thinking involves logical thinking, so it is important that as we teach we encourage logical thinking. In my instruction to the learners I use words like “deduce from the scenario” to get them to use deductive reasoning. Even the way I formulate case scenarios, I put them in such a way that the learner can work deductively maybe from the signs and symptoms to get to a diagnosis of a health problem” said one educator.

“Yes I also do that with my learners whereby when I teach history collection, they work from a number of signs and symptoms described by the patients, and compare and contrast those with what they observe through objective measures. From there they analyse all the data they have collected and reason deductively from it to get to a conclusion which is”, added another.

“To enhance the use of deductive reasoning as one of the methods that facilitate critical thinking I, for example give a statement from which the learners are directed to reason deductively, by generating ideas and assumptions to get to a conclusion that can either support or refute the statement.

They will then use the process of deductive reasoning to apply the statement to a number of problems to prove its applicability”, asserted one educator.

“An example could be asking the learners to work from a particular diagnostic statement, for example – “patient has cyanosis due to bronchospasms” and then they are asked to work deductively to prove or disprove this statement” added another.

“Yes, I also use case scenarios and case studies to get them to work either deductively or inductively. So I present a problem such as a patient with a particular health problem and a certain diagnostic finding, which they will need to work inductively from to get to a conclusive diagnosis, for example blood results interpretation using their conceptual knowledge to analyse and draw inferences to get to a conclusion”, said one of the educators.

“I also tend to use a lot of inquiry-based and discovery learning to get them to think inductively. I would give them a case scenario that requires the learners to search for knowledge that has not been covered, ask a question to get to a solution while requiring them to search for information, data that needs to be analysed or a hypothesis that must be tested as an example”, remarked another.

One of the educators said, “The use of inductive reasoning helps the learners to get into a habit of working logically through the learning task without jumping to conclusions. It provides them with new ideas which help expand their knowledge. It allows them to search for patterns in arguments and draw conclusions based on those patterns. The learners get moved from specific details and observations about patients to more general underlying principles or processes that explain the particular observations. It allows for open-ended exploration which is in line with critical thinking. I use inductive reasoning to let them discover new information for themselves.”

“Deductive reasoning on the other hand is narrow in nature. I use it when I want the learners to confirm a theory. I start first by giving the learners a body of general information with certain clues and ask them to deduce answers from a certain question, and to get to the answers they are compelled to use thinking skills such as analysis, interpretation, drawing and inferences” added another.

3.2.3.4 Use of collaboration and cooperation skills

“It is important that there is collaboration and cooperation among learners if we aim to facilitate their critical thinking. So I use a lot of collaborative and cooperative strategies to get them to work and think together. For instance I use group work which enhances their collaboration and cooperation, because the learners learn to empathise with each other and also learn to be sensitive to the point of view of others. They also learn to really listen to others and learn to understand that it is not only their views that matter but also get into a habit of assessing their own thinking and a habit of compromising”, said one educator.

“Collaboration and cooperation provides an opportunity for interaction among the learners because the discussion and sharing of ideas that goes on between them stimulate critical thinking. It also fosters a feeling of togetherness within the group and promote individual responsibility for learning through group interaction. The learners get involved with the subject matter and participate in the learning activity through their facilitated critical thinking skills” added another

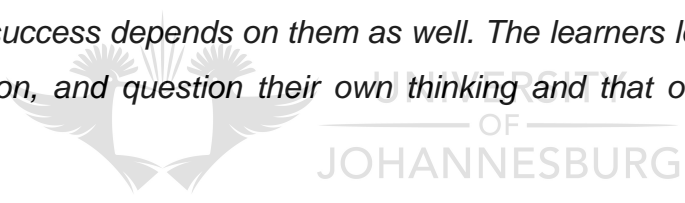
“Furthermore, they learn to recognise and appreciate the fact that their own experiences and thoughts are of value when shared collaboratively and cooperatively with others. The learners who are quiet also get an opportunity to share their views within a group, without the threat of a bigger group. Within the group they gain confidence in presenting findings in a group where they feel “safe” to share their views. Through collaboration in the learning area, the learners create their own meaning of the content based on group interaction and conversation” one educator said.

“Collaboration facilitates critical thinking in that during a collaborative activity the learners discuss, clarify their own ideas and evaluate those of others. Through collaboration the learners are able to look at a problem from different perspectives and are able to negotiate with fellow learners and make meaning as well as come up with solutions through shared understanding. They get to analyse, interpret, and predict” mentioned another.

“I use group activities to let the learners work collaboratively on a learning task, where they use a joint intellectual effort to achieve an outcome. You will find that through collaboration they share knowledge, personal, and clinical experience, language and culture that is built upon in the learning area, and there is usually shared authority, co-responsibility, and co-ownership of the teaching/learning interaction which is facilitative of critical thinking. I also encourage them to set goals within the content to stimulate their interests to assess what they are learning.

During the collaborative activity I also encourage the learners to listen to the diverse opinions of their fellow learners, support their knowledge claims with evidence, and use their facilitated critical thinking as they engage in a meaningful dialogue with others. During the collaboration there is also an element of cooperation among the learners,” said one educator.

“Cooperative learning is another method that I use to facilitate my learners’ critical thinking skills, as it promotes learner accountability and interaction as the individual learner knows that the group success depends on them as well. The learners learn to challenge ideas, share information, and question their own thinking and that of others without fear of alienation.



Through cooperative group activities the learners’ reflective skills are enhanced. However I have realised that cooperative group learning activities need to be carefully planned by the educator for meaningful learning to take place and for the facilitation of the learners’ critical thinking skill. The learners also learn to treat each other with respect, which is one of the attributes of critical thinking” added another.

“I think the value I see in using cooperative methods of teaching and learning is that the learners develop a positive interdependence and still maintain individual accountability for their learning. I also ensure that the learning area climate is non-threatening,” said one educator in response.

One educator said, *“Through cooperative learning the learners get exposed to diverse perspectives and alternatives. They share, exchange ideas, criticise, and provide feedback to one another. Their awareness of the learning outcomes and strategies is increased, which to me is an element of meta-cognition, a part of critical thinking. The learners get engaged in active and constructive learning because they talk, listen, read, write, and reflect within the group, while their critical thinking skills are facilitated. Through cooperative learning they assimilate new information and integrate, interpret it and construct new knowledge.”*

3.2.3.5 Use of reflection as a basis for learning

Reflection is necessary for critical questioning of the content, process, and premise underlying a teaching/learning experience if the aim is to facilitate the learners' critical thinking. The respondents also cited reflection as one of the methods they use to facilitate critical thinking in nursing education.

“I encourage my learners to do a lot of reflection on what they know to be, what is, and what should be. I always use statements such as “think back on the time”. I have realised that the use of reflective journals gives my learners an opportunity to share by writing down about their experiences in the clinical area, and to come back and share them with other learners.

During the presentation they are questioned, and this forces them to refer back to their experiences, analyse the events as they happened, draw inferences, explain and justify their actions. During this process they interrogate and internalise the subject matter. Their experiences provide a basis for the facilitation of their critical thinking, because they constantly get sent back to them for reference and have to provide justification to support their reasons” said one of the educators.

“During the activities in the learning area I give tasks that require the learners to reflect on their experiences as they reason about patient's health problems, and they get directed towards questioning their thinking that went into resolving the problems they were faced with in the clinical area, and attach meaning to the actions involved so as to have a better understanding of their experience” added one educator.

“The learning tasks that I give are such that they encourage the learners to use reflection to analyse and make judgments about the patient. They are also encouraged to consistently reflect on what they know, what they believe; they assess what they know, what they still have to know, and how they are going to bridge their knowledge gaps. For instance, I would give them a scenario that matches an experience they would have come across in the clinical area.

Following this I ask questions like- for an example, “think of a time when you nursed a patient with congestive cardiac failure who after administering digoxin to him presented with a severe bradycardia, reflect on your actions during the administration of the medication, what did you do or not do that could have led to the severe drop in the patient’s pulse rate, what was the effect of your action on the patient, on your colleagues who were on duty, what will you do differently next time, what additional knowledge do you think you need that will help you avoid a similar situation in future, how do you plan to acquire such knowledge?” said another.

“Reflection affords the learners the opportunity to take a step back and retrace the mental steps they took to solve a patient’s health problem and how they arrived at the clinical decision they made. As they respond to questions I allow them time to reflect on their answers. The questions I ask are those that require them to give reasons and evidence” one educator said.

“It is also important that the educator provides the learners with guidance through the thinking process as they explore their frames of reference in reflection. Through reflection they learn to apply new knowledge to their existing frames of reference and to think abstractly. So to get them to answer the why, how and what specific to clinical decisions they have made, I encourage reflection. The educator needs to also ensure that the learning activities stimulates questioning and curiosity which will in turn trigger reflective thinking. So the use of reflective journals as a teaching strategy can help to get them to reflect, which will in turn facilitate their critical thinking skills” added another.

One of the educators said, *“I have found that the use of reflection in the facilitation of the learners’ critical thinking gives meaning to the teaching/learning experience in the learning area, and promotes a deep approach to learning. To enhance their reflective skills I usually ask them to reformulate a problem, question their own assumptions, look at a patient’s health problem from multiple perspectives as they analyse it, and also identify their knowledge gaps in the process. Through reflection they learn to identify and analyse their assumptions and how they influence their actions and decisions in the clinical area. They also develop a questioning attitude and skills, which are necessary for critical thinking”*.

“To get the learners to think critically, I also ask them to reflect on the learning experience during the teaching/learning activity and afterwards. During the reflective activity they try to make meaning of the content, and meaning-making is an important part of the development of critical thinking skills, and it also help with the development of sound clinical judgment skills” said one educator.

“I have since realised that without reflection the learners become passive participants in the learning area without meaningful learning taking place. Through reflection they learn to make judgments in complex situations. The learners make meaning of the content by reflecting on their experiences. This forms a vital component of learning and the development of critical thinking” added another.

“Reflection affords the learners an opportunity to re-evaluate their learning experience and make a decision to do things differently the next time round” said one of educator.

3.2.3.6 Use of questioning and understanding

Questioning is important in facilitating critical thinking. Questioning must compel thoughtfulness, evaluation, and synthesis of facts and concepts.

“I normally ask questions with words such as ‘explain, compare, why, how did you get to that conclusion. What is the best way to solve this problem and why, do you agree or disagree with this statement?’ I agree that the questions asked in the learning area should force the learners to evaluate assumptions, viewpoints, consequences, and evidence” said one educator.

“Sometimes I would ask a learner to summarise an answer given by another. To get the learners to think critically I ask questions with multiple answers, and allow waiting time to get them thinking” added another.

“I also use a lot of thoughtful questioning in my teaching because through questioning I take the learners from the known to the unknown as well as stimulate debate and argument which are facilitative of critical thinking. It is important that the questions that we ask are such that they stimulate higher order thinking, for example evaluation and synthesis. For example I ask questions like, ‘what is the problem here, how did you arrive at the solution, why the choice of solution, how can you do it differently next time?’ said one educator.

Another educator said *“I try and ensure that the questions I ask the learners probe deeply or explore the meaning, justification, or logic behind a claim, position, or line of reasoning. The questions are such that they investigate assumptions, viewpoints, consequences, and evidence. I use the Socratic method of questioning which focuses on clarification of what is said. Socratic questioning fosters critical thinking, evaluation, and knowledge application by the learners. I find that this method of questioning probes beneath the surface of things and pinpoints problematic areas of their thinking processes. It encourages the learner to become their own questioner and to develop habits of critical reflection.”*

“Questioning should activate analysis, comparison, and evaluation. “Why” questions which require an explanation of principles, helps to determine the amount, direction, and quality of the learners’ thinking. The questioning needs to be such that it enables the learners to organise and interpret learning into generalisations through the use of critical thinking. As an educator I formulate questions that facilitate in the learners’ an attitude of critical inquiry”, added another.

Questioning is one of the most effective teaching strategies, and it can include co-operative questioning whereby the questions asked are formulated by the learners themselves. Co-operative questioning incorporates critical thinking dispositions and skills. The method empowers the learners with questioning skills, which is a necessary attribute in critical thinking” said another.

‘It is also important that the educator looks at the type of questions they ask. For example the questions can be factual, descriptive, clarifying, or value-seeking. The use of questioning helps to take the learners through a process of deductive and inductive reasoning. They get engaged in a mental effort of searching for answers and develop skills of information-seeking, which is characteristic of critical thinking” asserted one of the educators.

“The educator can question for information where the learners will search for information and evaluate the quality of that information, or question on assumptions whereby the learners are directed to examining what they take for granted. In questioning for relevance, as another example, the learner will use the skills of discriminating to evaluate the relevance of the response to the question under discussion. The use of evaluation also aids in the facilitation of critical thinking. Through evaluation the learners judge and assess the worth of the information they have, and that which they get from others. I also encourage the learners to continuously evaluate what goes on in the teaching/learning activities as their critical thinking is facilitated. Triggering the use of such a skill is facilitative of critical thinking” said one educator.

“Questioning is also vital for teaching and learning as it can be used to stimulate interaction between the teacher and learners and challenges the learner to defend their point of view. It is important though that the educator should consider the purpose of each question they pose, and then develop the appropriate level and type of question. Questions can be such that they require one or more specific answer, or alternatively ask a question that requires a variety of correct answers which forces the learners to use analysis, synthesis, and evaluation. I ensure that the questions stimulate a learner-centred discussion, thereby encouraging the development of critical thinking through learner talk in the learning area.

I also make sure that the questions I ask are short and to the point, and I usually rephrase the question and probe for further responses from the learners” said another in conclusion.

It is important that the methods used in the learning area are those that will facilitate critical thinking skills in the learners.

3.2.4 Evidential dimension

The next aspect within the framework of critical thinking that was taken into account is evidential considerations. Evidence is data on which judgment or a conclusion may be based. The notion is that a critical thinker will always consider evidence that is put forth in justification of arguments and claims, before making a judgment (Bennet, Maton & Kervin, 2008: 775-786).

The educators were asked to respond to the following question in as far as evidential considerations are concerned:

- How do you make sure that the learners consider, use, and provide evidence for their claims in facilitating their critical thinking?

The educators cited investigation, justification, and trail of evidence as evidential aspects that they consider when they facilitate the learners' critical thinking.

3.2.4.3 Investigate to determine facts

“I think it is important that the learners get used to looking at the evidence available to them in justifying their claims. For instance, during a case study I would ask them to go and investigate why a patient with asthma would present with bronchospasm and cyanosis. This will compel them to go and investigate first what bronchospasm is, and how it comes about in a patient with asthma. I always emphasise that the information they come up with needs to be scientifically based. This I find it teaches the learners that if you have a claim that you need to consider, and there is not enough information, then they should investigate to answer the what, why, and how before they make a conclusion” said one educator.

“Investigative skills are part of the critical thinking skills the learners should have. Investigation enables the learners to use critical thinking in the learning process of practice skills to solve clinical problems, and in the process respecting the point of view of others.

They also get to learn to identify areas of investigation, collect evidence, analyse it, present a point of view based on evidence, and evaluate the effectiveness of their work” said another in response.

Another educator said, *“I also find that sending them to go and investigate a phenomenon helps facilitate their critical thinking skills, because during the investigation they formulate reasonable questions about the problem they need to investigate. They will also be able to find the information relevant to the problem at hand, and how to access such information. They must also identify and look for additional learning material to use in the investigation”.*

“Investigation also involves a decision made on how to collect objective data on a patient with a health problem, for example they may be having a patient presenting with a cough, difficulty in breathing. They will decide how to get evidential information about the patient and how, where, and why they need to gather this evidence, for example what diagnostic procedures to follow, and why and how to interpret the findings. After investigation and coming up with evidence, they will then present to the whole class for their consideration of this evidence” added another.

“I have also found that when I question them about the results of their investigation, they tend to look for reasoning and justification for their evidence. What I do is give them a clinical problem and request them to go and investigate” added another.

“I think it is important that they are guided to search for literature related to the problem. They also need to formulate questions or even answers with outcomes that are related to the health problem. Collaboratively with their co-learners, they confirm the information or the results. They will then synthesise the information gathered and report back in the learning area.

During the reporting the fellow-learners investigate and evaluate the evidence presented against the context in which its presented to make a judgment, for example, if the investigation was about a patient with pneumonia, then [the] context used to look at the evidence should be pneumonia or respiratory problems. I also ensure they formulate criteria for making a judgment, and that they use the correct methods to form the particular judgment, such as using deductive reasoning skills to come to the judgment” said another in support (nodding head).

3.2.4.2 Justify reasoning

The educators also cited justification as another aspect of evidential consideration that they encourage the learners to use, as the learners facilitate their critical thinking skills. Justification is based on what one believes to be true or not. In the context of this study, justification is about learners defending and giving explanations of their reasoning behind their thinking; judgments, clinical decisions and nursing interventions help the learners to solve health problems (Renne, 2012: 43-82).

One educator said, *“During feedback I ask questions or ask other learners to ask their fellow-learner questions in relation to the feedback they give. The questions are such that the learner will be forced to explain [the] thinking skills they used to arrive at a judgment, explain their choice of treatment modality for a patient, and why, and defend their standpoint or view”*.

“I have also found that continuously asking for reasons leads to the development of the skills of using evidence or counter-evidence to justify their claims or results, and explain their assumptions” added another.

“I sometimes put up a health problem which poses a controversial topic, and ask them to argue it out while stating their belief on the subject, for example, [the] termination of pregnancy for minor girls. Thereafter I will take them through a process of justification of their beliefs. I will then ask them to gather and compare evidence from different perspectives like for instance, sociological, health, legal, and biblical perspectives.

They will then be asked to weigh the evidence using interpretative considerations of the evidence at hand, outline the explanatory values of their interpretations, choose an alternative avoiding the risk of conclusions, look at the consequences of an alternative judgment and defend their conclusions based on the fact that it represents the most practical understanding of the issue based on the available evidence” said one educator.

3.2.4.3 Provide a trail of evidence to strengthen facts

One of the educators responded by saying, “To get the trail of evidence, as the learners present their case studies or projects, first of all I look at how they got to the conclusion. I look at the process they used to gather information. They need to explain or demonstrate where they got the evidence from, how did they go about collecting it, is it relevant or not, can they justify their arguments, how do they back up those arguments using the evidence they have? I look to see if there is logic in the evidence they present”.

“It is important that they are able to explain the step-by-step process of how they got to their conclusions, what evidence they used to get to the conclusion, the amount of evidence they bring forth, is it complete, is it adequate and do they present it in a clear and understandable manner, are their arguments clear and not full of “waffles”? I also use a lot of evidence-based learning to get them to always back up their justifications and support their arguments with evidence” responded one educator.

“I think if you always ask them to give reasons for their actions, decisions, or choice of treatment they get used to regularly recognising patterns in the presented evidence, look for relationships in the data, formulate hypothesis based on the evidence, provide explanations and draw conclusions. In all this there is critical thinking” said another educator.

“I agree with you, after collecting clinical data I would instruct the learners to map out the processes they used to collect the data, interpret it, and they would also explain how they produced the evidence through a data audit trail. The evidence could be based on their clinical experience, observation of the patient, particular patient events, comparisons of similar patient events, or the opinion of experts or authorities” said one educator in support.

3.2.5 Criteriological dimension

Critical thinkers use certain intellectual standards to evaluate their critical thinking and that of others. The educators cited logical coherence, clarity, completeness, depth, relevance, and breadth as criteria they look for in the learners' facilitated critical thinking. Their responses were based on the following question

- How do you use the criteriological dimension of the critical thinking framework to facilitate the learners' critical thinking skills?

3.2.5.1 Logical Coherence

Critical thinking involves a logical pattern of thinking and the critical thinker will assess the logical in the thinking of others as well as their own.

"I try and ensure that ... what the learners are presenting, be it written or verbal, [that] there is logical coherence. I would ask questions such as 'does that make sense, does this follow for instance, before you implied this, and now you are saying that, how can that be true?'" said one of the educators.

Another educator said, *"In their clinical arguments, debates and presentation I ask the learners to evaluate the logic in the presented work by tracing a meaningful path or process that establishes an outcome of the health problem under discussion by using the evidence at hand to make a reliable and sound clinical decision"*.

3.2.5.2 Clarity

"In as far as clarity is concerned what I normally do, I ask a lot of clarity seeking questions such as, 'could you elaborate further on that point, could you express what you have just said differently, can you give a practical example of what you have said?'" Establishing clarity is important to assess critical thinking, because if their responses are not clear it becomes difficult to check if what they say is relevant or not, accurate or not.

Sometimes I would instruct them to formulate questions related to the issue at hand in their learning groups and then they would have to assess whether any question was left unanswered, or whether any detail caused confusion, or look for clues such as something that does not make sense in the discussion and ask clarity seeking questions like, 'could you explain that, please rephrase?' said one educator.

Another educator said *"Alternatively as they present a case they would be instructed to analyse their reasoning to identify irrelevant or inconsistent thought as they reason about patients' health problems. I also encourage the learners to get into the habit of thinking about their own thinking to evaluate it for clarity"*.

"Yes the learners also use language to clarify their communication about issues that are significant to nursing" added another.

"Yes they need to be taught to learn to say what they mean and mean what they say. Which is why I also encourage them to give concrete and specific examples that are clear" added another (laughing out loudly).

3.2.5.3 Completeness/holistic



One of the educators said, *"It is important that the learners understand that in critical thinking they need to provide and look for complete information in their arguments and those of others. If the information is incomplete it becomes difficult to assess the logic, clarity, and breadth of the information at hand. So to facilitate their critical thinking, I would ask them to evaluate the information they have about a patient for completeness, and in that way they learn that if the information at hand is incomplete, they have to look for more information or evidence before they can make any clinical decisions"*.

"I ensure that the learners through the manner in which I evaluate the information they present must be such that they are able to draw inferences from or draw information they will be able to use to justify their claims, and that they can only do this if the information about a patient situation they are presenting is complete. Regularly taking them through this exercise enables the learners to learn to test for completeness in the information" added another.

3.2.5.4 Depth

“I think it is also important to teach the learners that in critical thinking one also evaluates the depth of what the others are saying in order to really get to the bottom of what they are saying. So to evaluate the depth of their arguments or claims I ask questions like, ‘how does your answer address the significant issues in the question, how are you taking into consideration the problems in the question?’ I try and bring to their attention that a statement can be clear, logical, and relevant, but superficial” said another in response.

3.2.5.5 Relevance

One educator said, *“I normally do is to ask the learners questions that probe for relevance in information and arguments they put forward in class. I ask questions like, ‘of what relevance is that? How is that related to the discussion at hand?’ Questions of relevance compel the learner to differentiate between relevant and irrelevant information”*.

“We can also give them a case scenario and instruct the learners to look for relevant information that can be used to solve the health problem in the scenario. They are taught to look at thoughts and if they make sense” remarked another.

“It is important as well for the learners to see the educator evaluate logical relevance, for example, evaluating if the facts given are logically relevant to the issue at hand, for instance if they describe the signs and symptoms of a particular disease, these must be relevant to the described patho-physiology or the health problem under discussion. This facilitates the learners’ skills of evaluating for relevance and to arguing for a relevant fact, said one educator”.

3.2.5.6 Breadth

“It is also important to evaluate the breadth of what they say. Like we have already said, I also look at the breadth of their arguments and claims. I would ask questions like ‘do we need to consider another point of view, who has a different view in as far as this is concerned, What would this be like from a point of view of.....?’ Their line of reasoning may be relevant, clear, and deep, but lack breadth.

They may be arguing from one standpoint which gets deeply into an issue, but only recognise the insights of one side of the issue under discussion. This also facilitates the learners' critical thinking because they also learn to evaluate information and arguments from others", remarked another educator.

4.1 SUMMARY

This chapter is about the findings from the empirical data collection. It involves the participants' statements on how critical thinking can be facilitated using the framework of critical thinking, which includes the context, conceptual, methodological, evidential, and criteriological dimensions. Chapter 4 is conceptualisation of the empirical findings.



CONCEPTUALISATION

4.1 INTRODUCTION

The purpose of this chapter is to describe the conceptualisation of the findings as to how critical thinking can be facilitated using the critical thinking framework. Dickoff, James and Wiedenbach (1968) practice theory will be used to direct the conceptualisation process. The practice theory framework involves six elements that are the context within which the programme is developed, the agent, the recipient, dynamic, process or procedure, and the outcome. The researcher used the practice theory as it gives clear steps on how to conceptualise the findings.

4.2 CONCEPTUALISATION

Conceptualisation refers to clarification and analysis of key concepts in a study and the manner in which the research is integrated into a broader body of an existing conceptual framework. It also involves the underlying theoretical framework that directs research (Mouton, 2009: 109-110). Conceptualisation is about meaning-making, creating new options, and theorising. Meaning-making involves interpretation and constructing new knowledge that makes sense to the researcher.

4.2.1 Context

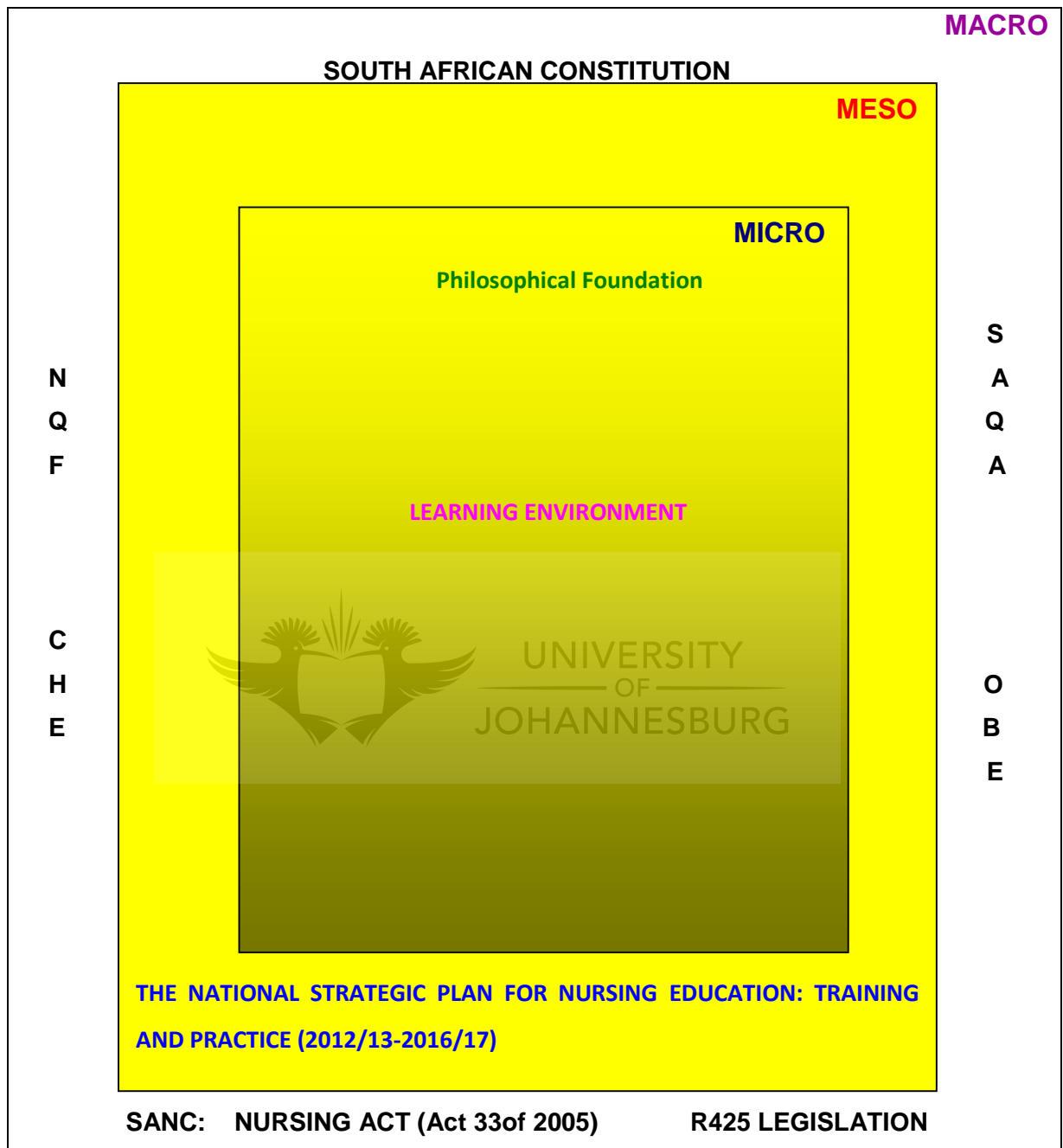
Responding to the question: How does the context influence the facilitation of critical thinking skills of the learners in nursing education? The empirical data from the participants indicated that legislative frameworks that have an influence on nursing education forms part of the contextual considerations. According to Paul (2009: 205-210), critical thinking does not take place in a vacuum, it takes place within a context that would influence such thinking; hence the conceptualisation of the context in which the learners' critical thinking is facilitated.

The context of this study consists of three levels. These contextual levels that have influence on the facilitation of critical thinking in nursing education are the macro, meso, and micro contexts. The macro context consists of legal and professional frameworks such as, the constitution of South Africa (Act 108 of 1996), Nursing Act (Act 33 of 2005), Regulation R425 of February 1985, South African Qualifications Act (Act 58 of 1995), the National Qualifications Framework (Act 67 of 2008), Council on Higher Education and Outcomes-Based Education. The meso context consists of the National Strategic Plan for Nursing Education: Training and Practice (2012/13-2016/17) on which this programme is based. Lastly, the micro context is made up by the learning environment created by the nurse educator to facilitate the critical thinking of the learners and the philosophical foundation grounding the programme.

Figure 4.1 depicts the contextual aspects that have an influence on the facilitation of critical thinking of the learners.



FIGURE 4.1 THE CONTEXT: Legal and professional frameworks that influence the facilitation of critical thinking.



4.2.1.1 Macro context

The macro context is concerned with the identification of the final destination at national level within a particular cultural context or broad curriculum development (Carl 2009: 107). In the context of this programme the macro level consists of legal professional frameworks that are conceptualised below. Nursing education takes place within a legal and professional framework that gives direction to the education and training of nurse learners. The educators cited this legislation framework as playing a pivotal role in influencing the context in which the learners' critical thinking is facilitated. The context in which critical thinking is facilitated should be such that the learner is at the centre of the teaching/learning activities. The philosophy of the regulatory body gives guidance on the training of student nurses and the development of educational programmes. The educational approach of outcomes-based education in the country gives direction on the development of the programme.

a) Constitution of South Africa

The constitution of South African states that everyone has a right to further education through reasonable measures and it must be made progressively available and accessible. The educational institutions must take into consideration equity and practicality as well as take into consideration past discriminatory practices (The Constitution of the Republic of South Africa – Act 108 of 1996).

b) Council on Higher Education

The Council on Higher Education is responsible for quality assurance in higher education, including programme accreditation, institutional audits, quality promotion and capacity development, standards development and the implementation of the Higher Education Qualifications Sub-Framework (HEQSF). It further monitors and reports on the state of the higher education system, including assessing whether, to what extent and with what consequences the vision, policy goals and objectives for higher education are being realised (Higher Education Act 101 of 1997)

c) Nursing Act (Act 33 of 2005)

The objectives of the SANC are to establish, improve, and control standards and quality of nursing education and training within the ambit of the Nursing Act (Act 33 of 2005) and any other applicable law. The Act provides for the Regulation (R425), which regulates the intended programme, and the stipulations thereof are described later in this section. The programme should aim at producing learners who are competent to independently practice comprehensive nursing in a manner and to the level prescribed, using their facilitated critical thinking skills. The learners should be capable of assuming responsibility and accountability of such nursing practice (Act 33 of 2005). This means that a qualified professional nurse should be able to use critical and reflective thinking skills in order to make meaningful decisions and solve problems as an independent practitioner in practice.

The SANC philosophy states that a nursing education programme's purpose should aim at the development of a nurse learner on a personal and professional level. The teaching/learning activities need to be complete in respect of the cognitive, psychomotor, and affective development so as to realise the programme outcomes. The programme should develop the learner's ability to be analytical, critical, evaluative, and creative thinking, and continuously stimulate their capacity to interpret scientific data for nursing actions, to draw conclusions and exercise independent judgment (SANC, 1993: 6).

The cognitive traits are necessary for accurate formulation of a nursing diagnosis, plans for appropriate nursing care actions, implementation thereof, and evaluation of the plans while maintaining an open-mind to reconsider, should there be a need to reformulate the care plan in the nursing care of patients using their psychomotor, affective, and cognitive skills. The psychomotor skills are necessary for procedures performed in practice. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution of practical activities. The psychomotor domain includes the ability to use sensory cues to guide motor activity through imitation, manipulation, precision, articulation, and naturalisation.

To imitate, the learner will observe and replicate an activity or process, and thereafter proceed to manipulation where they reproduce an activity from instruction or memory, or carry it out from a written or verbal instruction. Precision involves executing an activity or skill reliably, independently of the help of others, and demonstrates to others. They will then articulate the skill whereby they adapt and integrate expertise to satisfy a non-standard objective. They will relate and combine activities to develop a method. Finally the activity or skill is naturalised through automated unconscious mastery (Romiszowki, 2009: 199-224).

The affective domain includes receiving, responding, valuing, organising, and internalising. This domain is crucial in nursing in that it includes the manner in which the learners will deal emotionally with patients and others, and it involves traits such as feelings, values, appreciation, enthusiasm, motivation, and attitudes. The categories involved in the affective domain are receiving, which involves awareness, willingness to hear, and selected attention. Responding is demonstrated by active participation on the part of the learners and demonstration of enthusiasm for action, questioning, and probing of ideas. Learning outcomes may emphasise compliance in responding, willingness to respond, or satisfaction in responding (motivation), for example the learner participates in class discussion, questions new ideals, concepts, models, etc., in order to fully understand them (Romiszowki, 2009: 199-224).

Valuing is the worth or the value that the learner attaches to a particular object, phenomenon, or behaviour. This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalisation of a set of specified values, while clues to these values are expressed in the learner's overt behaviour and are often identifiable, for example by demonstration of a belief in the democratic process, sensitivity towards diversity, and the ability to solve problems. The learner will then organise values into priorities by contrasting different values, resolving conflicts between them, and creating a unique value system. The emphasis is on comparing, relating, and synthesising values, for example by recognising the need for balance between freedom and responsible behaviour, acceptance of responsibility for their behaviour, and by providing an explanation of the role of systematic planning in solving problems and acceptance of professional ethical standards. Internalising or characterisation, involves the learner having a value system that controls their behaviour.

The behaviour is pervasive, consistent, predictable, and most importantly, characteristic of the learner. Instructional objectives are concerned with the learner's general patterns of adjustment (personal, social, emotional). For example, the learner will show self-reliance when working independently, and will cooperate in group activities (displays teamwork). The learner will use an objective approach in problem-solving by displaying a professional commitment to ethical practice. They will further revise judgments and change behaviour in light of new evidence (Schellhase, 2008: 130-134).

Cognitive domain includes knowledge, comprehension, application, analysis, synthesis and evaluation. Knowledge includes the learner recalling or recognising specific facts, procedural patterns, concepts that serve in the development of intellectual skills, while understanding the meaning, translation and interpretation of instructions. The learner will further use concepts in a new situation, and unprompted, they make use of an abstraction and apply what was learned into unfamiliar situations in the practice. Through synthesis they will use analysis to separate concepts into component parts so that they understand its organisational structure and distinguish between facts and inferences. They will demonstrate an ability to build a pattern from diverse elements or put parts of information together to form a whole, with emphasis on creating a new meaning, and finally make judgments about the value of ideas or knowledge through the evaluation process (Romiszowki, 2009: 199-224).

Through quality nursing education and training, it is the SANC's objective to produce a nurse practitioner who will demonstrate a caring ethos within the profession and someone who is a life-long learner and a critical thinker, who will be able to evaluate and assure quality in practice. According to Bradshaw (2009: 465-468) a caring ethos means a nearness to the patient or client, and nurturing their ability to share in or take responsibility for the recovery and maintenance of health. They will demonstrate an understanding, unselfishness, and unity between themselves, the doctor, and the patient. They will exercise realism, reason, reassurance, and reserve about the patient's affairs. The learner will provide service, self-sacrifice, self-discipline, self-assurance, supporting, and sustaining the patient and their security. Lastly, they will provide expertise, for example, the education of the patient and their family and extension of the patient's ability to cope with their situation (Bradshaw, 2009: 465-468).

Lifelong learning is about meta-learning that refers to the learner's ability to plan, execute, monitor, and evaluate their own learning, and simultaneously develop an awareness of their cognitive processes. The learner will engage in meta-learning, which includes understanding how to learn. Meta-learning describes the awareness that a learner will develop regarding different approaches to learning (deep versus superficial learning, rote versus meaningful learning) and different learning styles. A learning style is a complex manner in which, and conditions under which learners most efficiently and effectively perceive, process, store, and recall what they are trying to learn. This means that through meta-learning the learners will become life-long learners (Soh & Blank, 2008: 27-58). Therefore the SANC's philosophy urges the educator to provide a learning environment that allows the learner to be a meta-learner.

Therefore, it is clear that the graduate that is required by SANC should be a critical thinker who will be able to function effectively and efficiently in practice, to meet the health care needs of the community. This need is emphasised by the legislative frameworks that influence the educational settings, such as the learning area within which this study takes place. The legislative frameworks further give direction to how the clinical learning environment should look in order to enhance facilitating critical thinking in nursing education.

The SANC as an Education and Training Quality Assurance body have mechanisms to regularly quality assure nursing education and practice by inspections, and the accreditation of curricula and nursing institutions.

d) Regulation relating to the approval of the minimum requirements for the education and training of a nurse (general, psychiatric, community) and midwife leading to registration (R425 February 1985)

The above-mentioned regulation is provided for by the Nursing Act (Act 33 of 2005). The outcomes of this regulation stipulates that the learning context should be such that the learners show respect for the dignity and uniqueness of the patients in their socio-cultural and religious context. The objective is to formulate a culture-sensitive and congruent nursing care to patients. The learner approaches and understands the patients as psychological, physical, and social beings.

The learner whose critical thinking is facilitated will be skilled to diagnose the patient's health problems, plan and implement therapeutic actions and nursing care along the health/illness continuum, and evaluation thereof. They will be able to direct and control the interaction with the patient in a manner that involves sympathetic and empathetic interaction. It is through these activities that the learner will collaborate harmoniously within the nursing and multidisciplinary team in terms of the principle of interdependence and co-operation in attaining a common goal, which is aiding the patient to return to a healthy state. Their facilitated critical thinking skills will enable them to delineate personal practice according to personal knowledge and skills, practise it independently and accept responsibility for it.

The learner will use their facilitated critical thinking skills to evince an enquiring and scientific approach to the problem of practice, and will be willing to initiate or accept change. Finally, the learner will have critical thinking cognitive, affective, and psychomotor skills for effective practice. They will apply their clinical knowledge by performing acts and procedures using scientifically-based physical, chemical, psychological, social, educational, and technological means applicable to health care practice of a patient through the use of their facilitated critical thinking (Regulation 425, 1985).

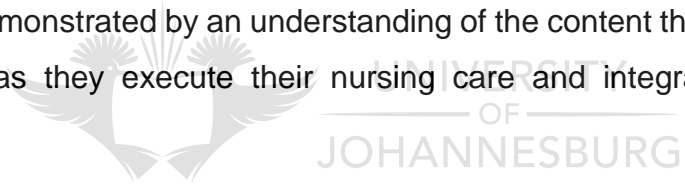
Therefore facilitation of the learners' critical thinking cannot take place outside the legal and professional frameworks prescribed, as these provide direction as to how the learners should be, and what skills they should possess at the end of this programme.

e) South African Qualifications Authority Act (Act 58 of 1995)

The SAQA (Act 58 of 1995) states that the nature of teaching and learning should be such that the learners are able to develop problem-solving skills and demonstrate applied competence through teaching and learning strategies that facilitate critical thinking. According to the SAQA (Act 58 of 1995) an educational programme should have clear outcomes, which include both critical cross-fields and specific outcomes that specify what the individual must know, do, and understand.

Based on the above assertions, the learners in this programme should be critical and reflective thinkers, have decision-making abilities in problem-solving, and purposefulness in solving practice problems, specifically within the context of clinical nursing education. By using critical thinking, the learners will assess their own applied competencies in relation to practice situations that call for their critical thinking skills. The learners should be able to collect, analyse, organise, and critically evaluate information.

According to the SAQA (Act 58 of 1995), applied competence is the overarching term for three interconnected kinds of competencies, which are practical, foundational, and reflexive competencies. Practical competence is the ability to demonstrate in an authentic context a consideration of a range of possibilities for action, make considered decisions about which possibility to follow, and performing the chosen action. This means that in the context of this study, the learners will be able to consider a range of possibilities of action, make considered decisions about which nursing action to follow, and perform the chosen action within the context of clinical nursing education while using their facilitated critical thinking skills. Practical competence is grounded in foundational competence, which will be demonstrated by an understanding of the content that underpins the actions they will take as they execute their nursing care and integrate it through reflexive competence.



Reflexive competence is competence in which the learners demonstrate the ability to integrate or connect performance and decision-making with understanding, and with an ability to adapt to change and unforeseen circumstances as they carry out their nursing care, as well as to explain the reasons behind these adaptations (Norms and Standards for Educators, Government Gazette 20844, 2000: 10). The learners should be able to demonstrate critical cross-field outcomes which include problem-solving, self-responsibility, awareness, research skills, communication skills, technology, advanced literacy learning strategies, and cultural and aesthetical skills (Act 58 of 1995).

According to the SAQA (Act 58 of 1995) the programme should provide an environment that will enable the learners to identify and solve problems through the use of critical, creative and reflective skills to make responsible decisions in collaboration with patients, while working effectively within a team in a collaborative, interactive dialectical and dialogic manner.

The learners should be able to demonstrate that they are organised and have an ability to manage self in a responsible and effective manner using their critical thinking skills. Furthermore they will demonstrate research skills in that they will exhibit the ability to collect, analyse, organise and evaluate information while collaboratively and cooperatively communicating effectively within the multi-disciplinary health team and fellow learners using visual and language skills in the mode of oral and written presentation.

The learners will further demonstrate the ability to reflect on and explore a variety of interactive collaborative and cooperative dialectic and dialogic learning strategies to learn more while using critical thinking skills in the well-developed information retrieval skill, critical analysis and synthesis of quantitative and qualitative information presentation skills following information technology. Lastly they will demonstrate the ability to use culture as a basis for language to provide a culture congruent and aesthetically sensitive care to patients (SAQA Act 58 of 1995). In this programme the learners should be able to demonstrate the above-mentioned critical cross-field outcomes using their critical thinking skills in practice.



f) National Qualifications Framework (Act 67 of 2008)

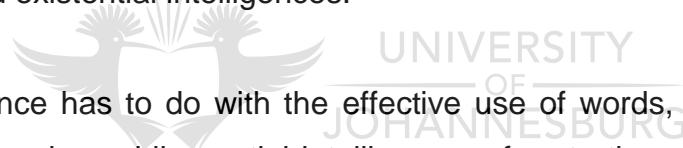
The National Qualifications Framework (NQF) subscribes to the principles of integration, coherence and flexibility. The objective of the NQF is to create an integrated national framework for learning achievements, enhance quality of education and training, and accelerate the redress of past unfair discrimination in education, training, and employment opportunities. The underpinning idea in standard-setting is that the learner should be placed at the centre of the education and training system. The NQF further aims at creating a system that would lead to the full personal development of the learners.

Creation of knowledge is said to be a democratic exercise that is independent of bias and coercion and is outcomes based (National Qualifications Framework, Act 67 of 2008). Therefore the programme should subscribe to the principle of integration, and form part of a system of human resource development in the healthcare setting that provides for the establishment of a unifying approach to the education and training of the learners.

Integration includes commitment, open communication, focusing on others, their needs and benefits. Furthermore it involves interdependence, a trust relationship, integrity, recognising and respecting cultural diversity, accountability, transparency and shared learning. The programme needs to be relevant and credible, and should be seen to be and remain responsive to the national needs, have national and international value and acceptance.

The programme should further subscribe to the principle of coherence and flexibility as it functions within a framework of principles and certification, and should allow for multiple approaches to the same learning outcome. The principle of coherence states that it is essential to eliminate all the non-essential information in the programme so as to minimise the demands on the cognitive resources. It is about avoiding extra information that will merely confuse the learner (Muller, Lee & Sharma, 2008: 211-221). The educator needs to accommodate differences and meet the needs of individual learners and assist them to achieve their maximum potential in critical thinking. Multiple approaches to learning involve the use of verbal, logical, spatial, kinaesthetic, intrapersonal, interpersonal, naturalistic, and existential intelligences.

Verbal intelligence has to do with the effective use of words, abstract reasoning, and conceptual patterning, while spatial intelligence refers to the capacity to visualise, and graphically represent visual and spatial concepts. Kinaesthetic intelligence is about the use of the body to express emotion, whereas intrapersonal intelligence refers to self-knowledge, and the ability to act adaptively on the basis of knowledge. It involves accurate self-image, awareness of one's emotions, self-discipline and self-understanding. Interpersonal intelligence is the ability to work cooperatively with others, and naturalistic intelligence refers to the ability to recognise patterns in nature, classify objects, and the mastery of taxonomy. Finally existential intelligence involves the use of multiple approaches by the learner while they experience learning in a meaningful, personalised, and relevant manner (Gouw, 2007: 60-74).



The programme should be based on standards that are expressed in terms of a nationally agreed framework and internationally acceptable outcomes. Furthermore, it needs to provide for the participation of all national stakeholders, and for easy access to appropriate levels of education and training for all prospective learners in a manner that facilitates progression.

The programme should provide for articulation, which means that the learners may, on successful completion of accredited prerequisites, move between components of the delivery system. It should ensure progression such that the framework of qualification allows learners to move through the levels of national qualification by appropriate combinations of the components of the delivery system. The programme should allow portability so that the learners can transfer their credits of qualifications from one learning institution or employer to another. Prior learning should be recognised and learners should be given credits for learning acquired in different ways, for example life experience (Sandberg, 2010: 99-115).

These principles are integrated in the level descriptors of the NQF. Level descriptors are broad generic quantitative statements against which specific learning outcomes can be compared and located. The function of the level descriptors is to unpack (and also to shape) in a discriminating way, what is meant by “complexity of learning”. The level descriptors describe applied competence and autonomy of learning in each level. The level descriptors further distinguish between the learning demands and the complexity of learning achieved at each level (National Qualifications Framework Act 67 of 2008).

The level descriptors describe learning at level 5 of the NQF. The focus of this study is to develop a programme at level 5 of the NQF, which will facilitate critical thinking and provide an indication of learning achievements or outcomes that are consistent with a professional nurse qualification at this level of training. In this programme the learners will typically demonstrate the following competencies according to level 5 of the NQF on completion of the course.

- A well-rounded and systematic knowledge base in clinical nursing education and a detailed interdisciplinary knowledge that is borrowed from nursing sciences.

- Interdisciplinary knowledge is demonstrated by knowledge and modes of thinking developed by expert communities (biology, physics, and physiology) etc.
- An informed understanding of nursing sciences' terms, concepts, rules, principles, and theories, an ability to map new knowledge regarding specific diseases, and an acceptance of a multiplicity of "right" answers.
- The use of facilitated critical thinking skills to effectively select and apply clinical nursing essential procedures, operations and techniques, an understanding of the central methods of enquiry in nursing care, and a knowledge of interrelated disciplines' mode of enquiry.
- An ability to deal with unfamiliar concrete and abstract problems and issues in nursing care using evidence-based solutions and theory-driven arguments by applying critical thinking skills.
- Well-developed information retrieval skills, critical analysis, and synthesis of quantitative and/or qualitative data presentation skills following prescribed formats using information technology skills effectively.
- An ability to present and communicate information and opinions in well-structured arguments, showing an awareness of audience and using academic/professional discourse appropriately.
- A capacity to operate in variable and unfamiliar learning contexts, requiring responsibility and initiative , a capacity to self-evaluate and identify and address own learning needs, and an ability to interact effectively in a learning group (SAQA Act 58 of 1995).

The programme will be pegged at level 8 of the NQF, which among other qualifications, has a basic nursing degree at this level. However for the purpose of the programme the participants that were used are first year Bcur learners who are at level 5 of the NQF. According to the NQF level descriptors the learners at this level should have a scope of knowledge which the learners are able to demonstrate using informed understanding of the core areas of one or more fields, disciplines or practices, and an informed understanding of the key terms, concepts, facts, general principles, rules and theories of nursing discipline or practice. Furthermore, the learners at this level should be able to use their critical thinking skills to apply their competencies to select and apply nursing procedures and techniques in practice.

The programme should enable learners to present and communicate information coherently and reliably, using academic and professional discourse conventions and formats appropriately while using critical thinking. Their facilitated critical thinking skills should enable them to evaluate their learning and to identify their learning needs within the learning environment, and they should have the capacity to take action to address these needs (SAQA Act 58 of 1995). The above-mentioned legislative frameworks form the external contextual factors that have a direct influence on the development of a programme to facilitate critical thinking in nursing education.

g) Outcomes-Based Education

The Outcomes-Based Education (OBE) is an educational approach that focuses on the desired end results of learning. According to Shepard (2008: 87-98) these end results are referred to as the outcomes. Outcomes based teaching/learning is learner-centred and result-oriented. Learner-centredness means the teaching/learning is driven by the learner. The assumption is that the learners should be allowed to learn to their full potential and the success they experience in their learning will build the learners' self-esteem, motivation, and willingness to strive for further successes. A further assumption is that the learning environment should be such that it creates and controls the conditions under which the learners can succeed in having their critical thinking skills facilitated.

The learning environment should be a democratic one in which the educator and the learners are equal partners in the teaching and learning process. The relationship between the educator and learners is one that is based on trust, cooperation, and collaboration. It is a problem-solving environment driven by the learners' choices of learning and decision-making. The interaction between the educator and learners enhances evidence-based contributions facilitated through scaffolding instruction (Carl, 2009: 6-11).

In OBE all the stakeholders, such as the educator, the learners, and parents need to share in the responsibility for learning (Crick, 2009:73-92). The preconditions for effective collaboration are democratic and inclusive; that is, it is collaboration that is free of hierarchies of any kind and it is all inclusive. This collaboration is based on democratic principles of openness, respectful dialogue, inquiry, reason, equity, and comfort with ambiguity (Persico & Pozzi, 2011: 1-15).

A democratic learning environment is one in which the learners work with others, understand others better, and respect differences. Each learner takes responsibility for decisions in the learning environment and makes positive contributions in carrying them out (Carl, 2009: 6-11). Therefore it means that a democratic interactive facilitation in a collaborative learning environment cannot be successful with an individual learner undertaking critical inquiry on their own. However, it is important that self-regulation, which involves self-examination and self-correction, should be coupled with an element of self-reflection. The collaborative learning environment needs multiple learner voices that see issues from multiple perspectives, engagement in dialogue, debating, arguing, and working together to achieve learning outcomes.

The value of collaboration in learning is that there is a higher level of productive learner behaviour, and a balance between the interactional rights of the educator and the learner. The educator relinquishes interpretative authority and facilitates collaborative reasoning, which promotes critical thinking (Dong, Anderson, Kim & Li, 2008: 400- 424). The programme that is directed by the OBE educational approach, is learner-centred and the outcomes will be critically thinking practitioners who are life-long learners. The broader outcome of this programme, which is critical thinking, will further be integrated into specific outcomes that constitute contextually demonstrated knowledge, skills, and values taught through the programme supporting one or more critical cross-field outcomes as stipulated by SAQA. The educator is not a presenter of a learning programme, but a facilitator of the learners' critical thinking skills (Persico & Pozzi, 2009:1-15).

4.2.1.2 Meso context

The meso level is a level of curriculum development at provincial or departmental level and has to do with the identification of aims within a specific curriculum (Carl, 2009: 88, 107). In the context of this programme the meso level has to do with the national strategic plan for nursing education that underpins the development of the programme.

a) The National Strategic Plan for Nursing Education

The purpose of the National Education, Training and Practice strategy is to develop, reconstruct and revitalise the profession to ensure that nursing and midwifery practitioners are equipped to address the disease burden and population health needs with a revitalised healthcare system in South Africa. The primary aim of nursing education and training is to provide adequate numbers of competent, caring nurses to meet the health needs of the country. Nursing education and training programmes should be harmonised with health service delivery needs while ensuring that qualifications obtained are commensurate with the scopes of practice and relevant legislation. Nursing education reforms must involve strong collaboration between the higher education and health sectors and other relevant stakeholders to ensure success. Nursing education and training should be a national competence (National Strategic Plan for Nurse Education, Training and Practice, 2012/13-2016/17).

4.2.1.3 Micro context

The concept micro refers to a level which has to do with the identification of aims within a specific subject module or lesson (Carl, 2009: 107). The programme is developed at classroom level to meet the SANC requirements. The micro context consists of the philosophical foundation on which the programme is based and the learning environment in which critical thinking is facilitated.

a) Philosophical foundations

According to Bruce, Klopper and Mellish (2011: 10), philosophy refers to a system of beliefs and values that the educator and learners subscribe to, either individually or collectively.

A professional philosophy in this instance refers to the statements of beliefs about nursing and expressions of values in nursing that are used as the bases for thinking and acting in nursing practice. The philosophical foundations in this programme presuppose a philosophy that will give direction to the development of critical thinking in nursing education. It will state the assumptions about the educator and the learners, the purpose of nursing, values and norms of the profession, and assumptions about learning and teaching. The philosophical grounding of this programme is based on the constructivistic approach to teaching and learning (Vygotsky, 1978: 65-85; Piaget, 1970: 57-58).

- *Constructivistic Theory*

The philosophical foundation guiding this programme is entrenched in the constructivistic worldview. The constructivist epistemology offers an alternative to traditional pedagogy in that it is learner focused and the learner's previous learning is taken into consideration. To the constructivist it is not just personal dispute, but all knowledge that is a matter of interpretation (Vygotsky, 1978: 65-85). Essentially this means that the educator should allow the learners to experience the world and to attach personal meaning to the knowledge constructed. This knowledge should be built on their existing frames of reference.

The constructivistic educator should ensure that an educational flexibility characterised by a dialogic exchange that aims at raising basic issues, probes beneath the surface of things, and pursues problematic areas of thought in the learning environment (Harris & Park, 2008: 548-551). Such educational flexibility could be facilitated by using a variety of approaches to teaching and learning, such as problem-based learning, reflective learning, cooperative learning, evidence-based learning, and community-based learning. These frames of reference form a foundation upon which the learners' critical thinking will be facilitated through the programme.

Constructivistic approach is exquisitely attentive to the "process" of learning and the experiences the educator and learners bring into the learning environment. The educator's awareness of the process will make them more flexible and receptive, while influencing the learners' enthusiasms, disaffections and the need to pause or proceed in the teaching/learning exercise (Loyens & Gijbels, 2008: 351-357).

The assumption is that the learners will actively construct their own knowledge and understanding as their critical thinking is facilitated. They should be allowed to make connections, build mental schemata, and develop new concepts from their previous understanding (Lewis, Perry & Hurd, 2009: 285-304).

Instead of learning a set of concepts and theories, the learners should be granted the opportunity to develop evolving knowledge bases through the interaction with others, which requires their active involvement in the learning process. According to Vygotsky (1978: 65-86) learning occurs in a context of social interactions. Therefore, it means that the learners should be provided with an environment that enables them to interactively take risks, accept challenges, and understand how and why they need to have their critical thinking skills facilitated as they interact with others.

On the other hand, Piaget (1970: 57-58) believed that knowledge is about structure, understanding how the facts fit together, having mental models or schemata that allow one to accurately assimilate additional information and to make useful predictions and conclusions from it. The process of knowledge construction involves three stages, these are assimilation, accommodation, and equilibration. Learning area experiences should be planned to allow opportunities for assimilation and accommodation. Assimilation involves the learner incorporating new knowledge into pre-existing cognitive structures.

The learners need to explore, to manipulate, to experiment, to question, and to search out answers for themselves – activity is essential. Accommodation refers to a process where the existing cognitive structure changes to accommodate new knowledge, and enables the learner to form schema. Equilibration refers to striking a balance between assimilation and accommodation (Piaget, 1970: 57-58). The educator should be able to assess the learner's present cognitive level and their strengths and weaknesses.

Instruction should be individualised as much as possible, and the learners should have opportunities to communicate with one another, to argue, and to debate issues. The educators are seen as facilitators of knowledge – they are there to guide and stimulate the learners. The learners should be allowed to make mistakes and learn from them.

Learning is much more meaningful if the learner is allowed to experiment on their own rather than listening to the educator lecturing.

The educator should present learners with learning materials and situations that allow them to discover new learning. In line with the constructivistic view the learners should be given an opportunity to restructure information in ways that make sense to them.

The learning/teaching activity should allow the learners to generate questions and comments as information becomes internalised. The constructivistic approach states that to gradually become independent critical thinkers, the learners should first experience critical thinking with fellow learners and the educator.

The implication is that initially the educator, or a more able peer guides the learners' activities. As the learners acquire skills for critical thinking they are allowed to gradually take control of their learning and how they learn, until such time that they are completely independent of the educator's or peer's guidance. The educator and learners should share the responsibility of the learning process, with the learners gradually being allowed to take the lead in the learning process (Wahlstrom & Louis, 2008: 458-495). The educator is required to continue guiding the emerging critical thinking skills and provide support where needed. As the educator scaffolds critical thinking acquisition they will gradually relinquish the lead role, and become co-learners in the learning/teaching process (Flynt & Brozo, 2010: 526-528).

A constructivistic learning environment allows the learners to create their own concepts and makes knowledge their own property. The emphasis is on promoting active participation and collaboration. The focus is on assisted discovery through learner-educator interaction using questioning, predicting, summarising, and clarifying, among other strategies. There is dynamic support and considerate guidance based on the learner's needs. The learner is exposed to discussion, research, collaboration, and group work during problem analysis and problem solving.

Learning is the development of a higher-level psychological process occurring first on an interpersonal level through social interaction, and later via internalisation. Wahlstrom and Louis (2008: 458-495) are of the opinion that within any given teaching/learning setting the zone of proximal development is determined by the learner's level of development and the form of instruction.

The implication is that instruction must proceed developmentally with all the cognitive developmental factors being taken into consideration. This means that as the learners' critical thinking skills are facilitated, the approach needs to be developmental in that one skill should be built on another.

b) Learning environment

The learning environment refers to the micro context within which the learners' critical thinking is facilitated. The participants stated that the learning environment should be supportive, friendly, non-threatening, non-competitive and psychologically safe. The learning environment that encourages critical thinking possesses distinguishing features that assist programme evaluators and teachers to assess whether critical thinking is a regular occurrence in a particular classroom. Scheuer, Loll, Pinkwart and McLaren (2010: 43-102) believe that a critical thinking learning environment commonly reflects frequent questions, developmental tension with the contingency of conclusions, and active learning.

These attributes reinforce one another to provide developmental stimuli for enhanced critical thinking. The educator is responsible for creating a learning environment that is conducive to facilitating critical thinking (Ali & Panther, 2008: 35-39). Educators need to encourage and reinforce values of critical thinking, such as open-mindedness, empathy, rationality, and self-correction. The educator is not an "authority" providing learners with the right answers, but a facilitator assisting and supporting learners to figure out answers for themselves, and to identify and solve problems. The learners who learn in such an environment are encouraged to believe in the efficacy of their own thinking and to think for themselves. The learning area must have a climate that is conducive to discourse and dialogue (Laman, Jewett, Jennings, Wilson & Souto-Manning, 2012: 197-216)

Additionally, the educator can promote thinking by creating a favorable learning environment. Ali & Panther (2008: 35-39) indicates that the educator can promote thinking in learners by eradicating any negative attitudes that inhibit thinking. The educators must create a democratic learning environment that motivates the learners to express their views without fear of intimidation. The learning environment should be a "safe" one in which the learners freely share their feelings and thoughts without being ridiculed. It should be such that the learners know they can make mistakes.

The environmental safety should allow the learners to put their energy into the exploration of different learning approaches, rather than spending it being over-cautious and self-conscious (Costa, 2008: 11-12).

An authoritarian learning environment, whether associated with the educator and/or learners, inhibits thinking rather than promoting it. It is suggested that democratic values like dialoguing, negotiating, and consensus-building should be cultivated in the learning environment to develop learners who have the freedom to express their views. In the learning environment, learners should be able to share their thoughts without fear of ridicule, and negative attitudes that block thinking should be avoided (Ali & Panther, 2008: 35-39). Learners should tolerate and encourage each other in the learning process. The learning environment should encourage cultural sensitivity that demands accommodation of cultural diversity (Leininger, 1998: 57-63). The educator needs to give attention to this part of the planning to see that the learning environment processes and the emotional climate are conducive to optimal learning.

The learning environment climate needs to encourage the learners to take risks and try out new approaches. Among other things, this means that the learners need to feel safe their attempts to solve problems need to be respected, their unconventional approaches need to be rewarded, and they need to feel confident that the educator knows where to pitch the challenge for them – that is not too difficult nor too easy or too repetitive. The learners should be allowed to work on real problems with personal relevance to them and on challenging problems that provide opportunities for use of their facilitated critical thinking skills.

According to Kop (2011: 19-38) a learning environment that fosters critical thought should be one where the learners are allowed to use imaginative problem-solving, and where involvement in a learner-centred discourse is participatory and interactive. The learning environment should encourage learners' involvement in group deliberation and group problem-solving. The educator should use learning material that reflects learners' real-life experiences and are designed to foster participation in small-group discussion to assess reasons, examine evidence, and arrive at a reflective judgment.

Furthermore, Kop (2011: 19-38) asserted that the learning environment should be conducive to learning through discovery. The educator needs to ensure that the learning environment allows for frequent challenging of the learners to identify and examine assumptions, including their own. The learning environment should be a motivating place for learners to express their views without fear of intimidation. Fairness, tolerance, dialogue, negotiation, care, active participation, and respect for each other's opinions are hallmarks of a thinking learning environment.

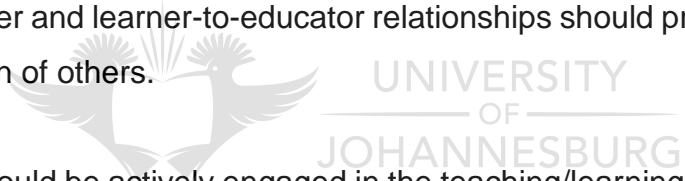
Kop (2011: 19-38) further argues that the learning environment should raise expectations and extend opportunities for the learners to use their ability to think. The educator is obliged to create a learning environment that awakens the learners' awareness, critical thinking skills, and those of others. The environment should be one that encourages the learners to participate effectively in discourse as a central point of making meaning. Effective discourse will depend on how well the educator can create a learning environment in which the learners are free from coercion; have equal opportunity to assume the various roles of discourse (to advance beliefs, challenge, defend, explain, assess evidence, and judge arguments).

Furthermore the learners become critically reflective of assumptions, are empathic and open to other perspectives, are willing to listen and to search for common ground or a synthesis of different points of view, and can make a tentative best judgment to guide their action (Kop, 2011:19-38). Therefore, in the learning environment that enhances and facilitates critical thinking there are two major supportive mechanisms, these are the instructions given, and the educator's attitude. Critical thinking will be facilitated where the educator has a favourable attitude towards critical thinking and is strongly dedicated to encouraging such thinking in learners.

The learning environment should be a place where the values of critical thinking (truth, open-mindedness, empathy, autonomy, rationality, and self-criticism) are encouraged and rewarded (Yanchar, Slife & Warne, 2008: 265). In this environment the learners learn to have faith in the power of their own minds to identify and solve problems. They will learn to trust in the efficacy of their own critical thinking. Thinking will not be something they will fear engaging in.

Authorities will not tell them the correct answers but will be those who encourage and help them to figure out answers for themselves, and who encourage them to discover the powerful resources of their own minds. In this learning environment the educator is more of a questioner than a preacher. The educator asks questions that probe meanings, that request reasons and evidence that facilitate elaboration, and that prevents discussion from becoming confusing. Questions in this environment should provide incentives for listening to what others have to say (English, 2011: 171-189).

Furthermore, it could be concluded that for the educational environment to facilitate critical thinking, the educators should ensure that there is continuous mutual support between the learners and themselves. The relationships should be such that there is empathetic collaboration, open-minded interaction, and a disposition to self-assessment and self-criticism by both the educator and learners. The classroom environment should enhance a feeling of safety with the affirmation of learners to be critical thinkers as their skills are facilitated. The learners' confidence should be built by treating them as partners in learning. Sound relationships should be continually maintained and monitored. The learner-to-learner and learner-to-educator relationships should promote positive attitudes and appreciation of others.



The learners should be actively engaged in the teaching/learning process and respond to the needs of others. This open and non-threatening teaching environment is ideal for facilitating critical thinking. Self-correction and monitoring should be used to judge the rationality of thinking, as well as reflexivity. When using critical thinking, individuals step back and reflect on the quality of that thinking.

Critical thinking involves complex mental operations that cannot be broken into discrete styles of thinking; it involves the students' total intellectual functioning and not a narrowly defined set of skills. The next elements of the framework that are going to be conceptualised below are the agent (educator) and the recipient (learner).

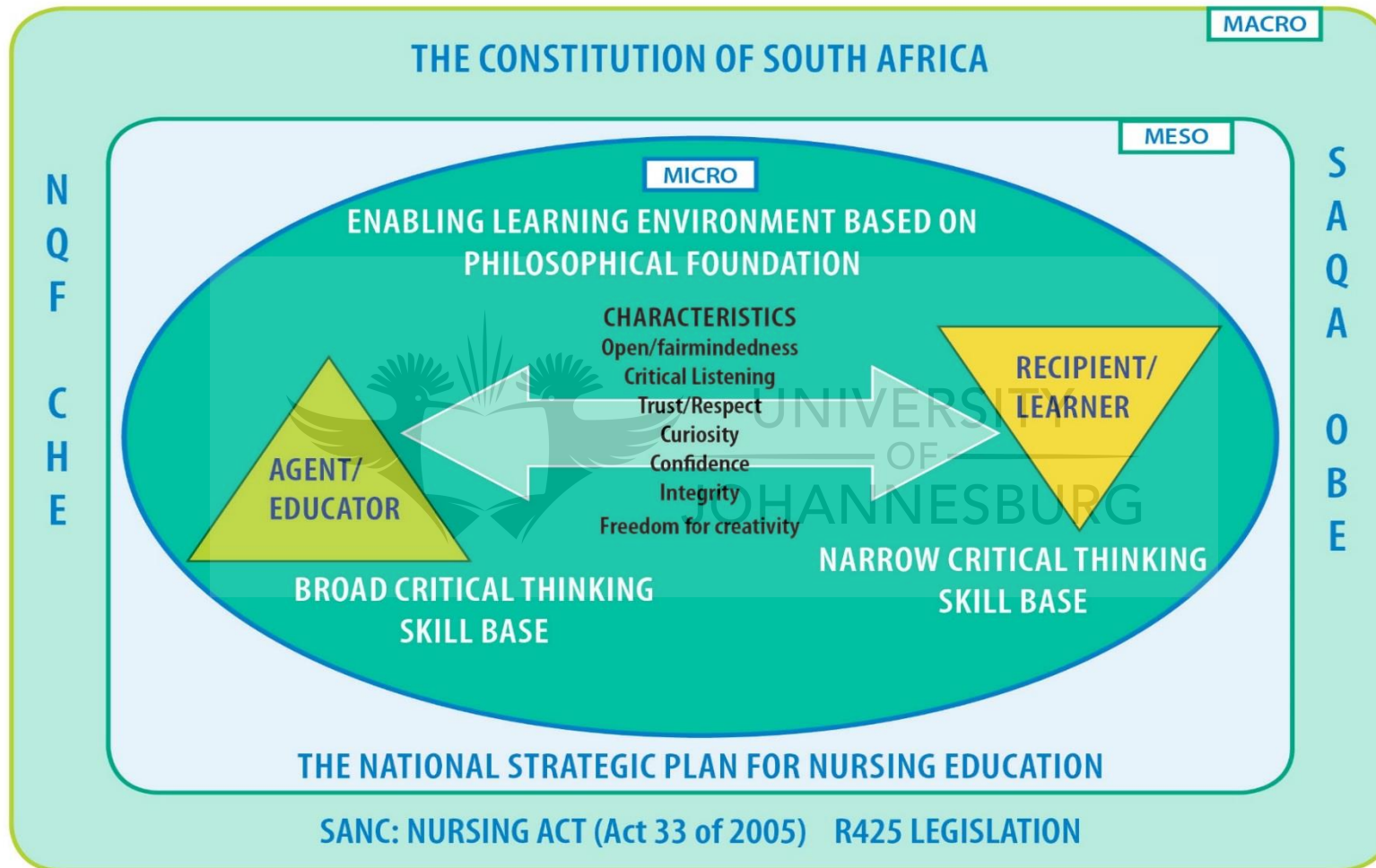
4.2.2 Agent/Recipient

According to the framework of Dickoff et al. (1968: 435) the practice theory elements consists of the context, agent, recipient, dynamic, process and outcome. In the context of this study the agent, who is the educator, is responsible for the facilitation of the critical thinking skills of the learners through the programme that will be developed. The recipient is the learner whose critical thinking skills will be facilitated through the programme.

The dynamic refers to the driving force behind the facilitation of the learners' critical thinking skills. Figure 4.2 is a conceptual framework depicting the agent and the recipient. From henceforth the agent will be referred to as the educator and the recipient as the learner, and conceptualisation of their attributes will follow hereunder.



Figure 4.2
Agent and recipient



The conceptual framework in Figure 4.2 depicts the educator and the learner as participants who interact in the micro environment and are influenced by the contextual factors from the macro and meso environments. According to the respondents, the agent and recipient are supposed to have specific characteristics that facilitates critical thinking. The characteristics of the agent and recipient required to facilitate critical thinking of learners in the learning environment are open and fair-mindedness, willingness to listen, freedom for creativity, trust, curiosity, confidence, and integrity and they will be conceptualised as such. Zhang and Lambert (2008: 175-181) also asserts that the critical thinking dispositions that the educator and learners need to have, also integrate the use of intellectual traits which are intellectual integrity, intellectual courage, intellectual humility, intellectual empathy, intellectual perseverance, and faith in reason. The value of the intellectual traits to the agent and the recipient in the programme is that in the interactive facilitation of critical thinking they will avoid self-serving and egocentric tendencies that are obstacles to critical thinking (Zhang & Lambert, 2008: 175-181).

The triangle depicting the educator shows that they have an abundance of critical thinking skills and since the participants in the programme will be 1st year learners who will need 100% facilitation of their critical thinking skills. The inverted triangle depicts the learner as initially having a narrow critical thinking skills base. Through the envisaged programme the educator will scaffold the learner's intended critical thinking skills through interactive facilitation till they become critical thinkers (Ausabel, 1968:148,330; Vytgosky, 1978: 65-85). Learning is the development of a higher-level psychological process occurring first on an interpersonal level through social interaction, and later through internalisation. Ali and Panther (2008: 35-39) are of the opinion that within any given learning area, the zone of proximal development is determined by the learner's level of development and the form of instruction. The implication is that instruction must proceed developmentally with all the cognitive developmental factors being taken into consideration. This means that as the learners' critical thinking skills are facilitated, the approach should be developmental in nature.

Vygotsky (1978: 65-68) asserted that each learner's development is also shaped by the environment in which it takes place. The implication is that the learning environment in which collaborative and dialogic interactive facilitation takes place, should be conducive to facilitating the learners' critical thinking.

Assistance in the zone of proximal development is called scaffolding, and it is a major component of the educator's activity. Scaffolding is characterised by the social interaction among the learners and the educator that precedes internalisation of the dispositions and the skills of critical thinking. Scaffolding should be developed to assist learners to internalise critical thinking skills. The educator will initially give full support in the facilitation of the learners through the critical thinking programme and gradually reduce their support as the learners become adept at critical thinking till they independently think critically without the direction and support of the educator.

According to Pawan (2008: 1450-1462) scaffolding instruction requires the establishment of inter-subjectivity, or a shared understanding of the content. Support is provided through scaffolding. Scaffolding involves controlling those critical thinking skills that are initially beyond the learners' capabilities. As the educator or more able peers create a supportive structure that can trigger and maintain interest, the learner becomes involved with the teaching and learning activities. The character traits of both the educator and the learner influencing the micro environment are described below.

4.2.2.1 Characteristics of the agent and the recipient

Table 4.1 depicts the characteristics required to facilitate critical thinking.

Table 4.1 Characteristics of the Agent and Recipient

- | |
|---|
| <ul style="list-style-type: none">• Open-mindedness/fair-mindedness• Willingness to critically listen and read• Freedom for creativity• Trust• Curiosity• Confidence• Integrity |
|---|

➤ *Open-mindedness and fair-mindedness*

Participants regarded open-mindedness and fair-mindedness to be important characteristics that the educator and learners should have. Open-mindedness and fair-mindedness are complementary. An open-minded person usually maintains a degree of fair-mindedness in their thinking. According to Facione (1990: 13), open-mindedness involves an inclination to be receptive to divergent worldviews, consideration for alternatives, and understanding of the opinions of other people. Being open-minded means the educator and learners will reveal their minds, feelings, or knowledge, and encourage one another to talk freely and frankly. According to Stapleton (2011: 14-23) open-mindedness as a disposition is compatible with having rules of conduct, beliefs, and firm opinions. Educators and learners need to consider their own positions as being subject to scrutiny, challenge, and revision in light of critical reflection.

Stapleton (2011: 14-23) asserts that open-mindedness involves an element of objectivity that will enable the educators and learners to be explicitly conscious of the beliefs they hold, and they become skilled in recognising when those beliefs shape their experience. This characteristic will enable the educators and the learners to see that events can be distinguished only to the degree that the assumptions they are making about themselves and others are truly justifiable. They will seriously consider points of view of other than their own while reasoning from starting points with which they disagree, without letting the disagreement interfere with their reasoning. Their tendency will be to withhold judgment when the evidence and reasons are insufficient.

On the other hand, fair-mindedness is also an important characteristic required to facilitate critical thinking, especially in the cognitive context in that the point of view of others is treated fairly. In a context where fair-mindedness is practised, there is tolerance of the opinions of others. Stapleton (2011: 14-23) further asserts that the open- and fair-minded educators and learners will appreciate alternative perspectives. They will demonstrate willingness to respect the rights of others to have different opinions. The educators and learners will be inclined to display willingness and consciousness of the need to treat all viewpoints alike, without reference to their own feelings or vested interests, nor the feelings or vested interests of others.

The value of open-mindedness and fair-mindedness in the learning environment that facilitates critical thinking, and educators and learners will be receptive, consider divergent viewpoints, and exercise fairness when making judgments.

On the other hand Jenks (2011: 209-235) cited that to be fair-minded the educator and learners should think critically about issues, consider the strengths and weaknesses of opposing points of view; imaginatively put themselves in the place of others to genuinely understand them and overcome their egocentric tendency to identify the truth with their immediate perceptions or long-standing thought or belief. This trait correlates with the ability to accurately reconstruct the viewpoints and reasoning of others, and to reason from premises, assumptions, and ideas other than their own. It also correlates with their willingness to remember occasions when they were wrong in the past despite an intense feeling of correctness, as well as the ability to imagine being similarly deceived in a situation.

The educator and learners will be inclined to realise the unfairness and absurdity of judging unfamiliar ideas until they fully understand them. They will avoid statements like, "I do not know what you think but, whatever it is, it's wrong." The possession of a character trait of open-mindedness will enable the educator and learners to display the intellectual trait intellectual empathy. According to Mulnix (2012: 464-479) empathy, in the affective sense, is the vicarious sharing of an affect. It is an emotional response that has to do with the involvement of psychological processes that make a person have feelings that are more congruent with another's situation than with their own situation. In contrast to mere emotional contagion, genuine empathy presupposes the ability to differentiate between oneself and the other.

It requires that the educator and learner are aware of the fact that one is having an affective experience due to the perception of where the other is coming from, and looks at issues through "their eyes". Moreover, empathy outside the realm of a direct perceptual encounter involves some appreciation of the other person's emotion as an appropriate response to their situation.

On the other hand, Dearing and Steadman (2009: 173-182) refers to the concept of intellectual empathy as meaning that the educator and learners have the ability to put themselves imaginatively in the place of others, in order to genuinely understand them. They recognise their egocentric tendencies to identify the truth with their immediate perceptions or longstanding beliefs. Intellectual empathy correlates with the ability to accurately reconstruct the viewpoints and reasoning of others, and to reason from premises, assumptions, and ideas other than their own. They will remember the instances when they were wrong, despite an intense conviction that they were right, and consider that they might be similarly deceived in a situation. The implication for the learning environment is that it should be such that the educator and learners can intellectually empathise with others. Therefore the implication is that open-mindedness of the educator and the learners will enable them to put themselves in the situations of others so as to understand their point of view while being open to the fact that they could be wrong in their thinking.

➤ *Willingness to critically listen and read*

The willingness to listen is an attribute characteristic of critical thinkers. Critical thinking involves consistent willingness, motivation, and inclination to listen to the viewpoints of others. According to Fisher (2008: 19-28) willingness to listen involves the respect of others' right to hold a different opinion. On the other hand, Houston (2008: 61-79) argues that listening in critical thinking involves a critical spirit that enables the listener to monitor how they listen, so as to maximise their accurate understanding of what others are saying. Through a willingness to listen the educator and the learners will be able to evaluate the logic of communication between themselves and others, and appreciate that everything spoken expresses a point of view.

Houston (2008: 61-79) further asserts that the educator and learners will listen in order to empathetically and analytically enter into the perspective of others. The educator is responsible for creating a learning climate where the learners are assured of the importance of their inputs to the teaching/learning activities by being listened to. The educator should not ignore knowingly or otherwise the individuality of each learner. They need to demonstrate their willingness to listen so that in turn the learners will learn to listen to the opinions of others, which will enrich their learning experience, their ideas, and thoughts.

The value of being willing to listen assures others that their opinions count and are important, thus facilitating critical thinking so that learners will willingly share their viewpoints and thoughts without fear of being ridiculed or shut down.

Couper (2011: 159-182) refers to critical listening as the art of silent dialogue. Critical thinkers realise that listening can be done passively and uncritically, or actively and critically. Listening is complex in that it requires the educator and learners to take the words of another and translate them into ideas that make sense to them. Listeners must continually interpret what others say within the confines of their own experiences. They will find a way to enter into their points of view, shift their minds to follow the speakers' trail of thought. In short listeners need to learn how to listen actively and critically. They need to recognise that listening is an art involving skills that they can develop only with time and practice. The learners and educator need to learn, for example, that to listen and learn from what they are hearing, they need to learn to ask key questions that enable them to locate themselves in the thoughts of another.

Listeners should practise asking questions, such as: "I'm not sure I understand you when you say..., could you explain that further?" "Could you give me an example or illustration of this?" "Would you also say...?" "Let me see if I understand you. What you are saying is Is that right?" "How do you respond to this objection?" Critical readers ask questions as they read, and use those questions to orient themselves to what an author is saying. Critical listeners ask questions as they listen to orient themselves to what a speaker is saying: Why does she say that? What examples could I give to illustrate that point? What is the main point? How does this detail relate? (Houston, 2008: 61-79).

- *Critical listening*

According to Couper (2011: 159-182) critical listening is a mode of monitoring how one is listening so as to maximise one's accurate understanding of what another person is saying. By understanding the logic of another person's communication, that everything spoken expresses a point of view, uses some idea and not others, has implications. A learner whose critical thinking is facilitated can listen so as to enter empathetically and analytically into the perspective of others.

Gehrke (2009: 1-6) is of the opinion that critical listening seeks to evaluate and judge, and to form an opinion about what is being said. Judgment includes assessing strengths and weaknesses, agreement and approval. This form of listening requires significant real-time cognitive effort, as the listening learners analyse what is being said, and relates it to existing knowledge and rules whilst simultaneously listening to the ongoing words from the educator and fellow learners. The learner whose critical thinking is facilitated will know that it is easy to misunderstand what is said by another, and that it is difficult to integrate another's thinking into their own. On comparing speaking and listening, when the learner speaks they will also keep track of their own ideas, arrange them in some order, and express thoughts that are intimately familiar to their own.

Critical listening enables the educator and learner to be critically conscious of their thinking so that this does not contaminate the effort to find true meaning. The aim is to understand and challenge the perspectives of others, but always with the intention of moving towards greater understanding for the benefit of all. Despite the current enthusiasm for teaching critical thinking and the need acknowledged by many educators to improve the learners' speaking and listening skills, very few educators encourage critical listening skills among their learners. According to Gehrke (2009: 1-6) one reason among many that listening skills are not actively encouraged in learning environments is that there is confusion between "listening" with "hearing". Listening is actually more than hearing, it also involves sensing, interpretation, evaluation, and response. Furthermore, it is through speaking and listening that the learners will acquire knowledge, develop language, and increase their understanding.

As learners learn a language, they learn to think, and the pervasiveness of language itself in the teaching of any subject suggests that the teaching of listening skills can be a primary strategy in the development of critical thinking skills. Some of the skills needed for effective critical listening are evaluating the strength of the speaker's main ideas and the quality of supporting evidence, recognising the difference between fact and opinion, and recognising the use of loaded language, stereotypes, and/or emotional appeals. These skills can and should be taught (Gehrke, 2009: 1-6).

However, Cranton (2008: 13-14) argues that listening is more complex because the listener must take another person's words and translate them into ideas that make sense to them. When one listens one cannot anticipate where their thoughts are leading them to. The learners will continually interpret what others say within the confines of their own experiences. They will shift their minds to follow their train of thought.

Therefore they should be encouraged to listen actively and critically. The learners will be questioned as they listen, for example they may ask questions such as "Why do they say that?", or "How does this detail relate to the main point?" This exercise will lead the learners that are engaged in dialogue to go through dialogical reasoning, which involves comparing perspectives, interpretations and theories. The learner will listen closely and attentively in order to have a meaningful exchange and to find a shared source of meaning without "jumping" to a conclusion.

The educator and learners that engage in critical listening expect well supported arguments from their fellow learners, and arguments that contain both true propositions and valid inferences or conclusions. When evaluating arguments they will ask several questions about the proposition or statements made. For example, "Are the statements true"? "Is the data the best that can be obtained"? "Are the sources of the data known to the listeners"? "Do listeners know where the information came from"? "Is the data accurately portrayed? Is the data representative"? That is, would all the data, or at least an aspect of it, show the same thing? The above questions may all be answered to the critical listener's satisfaction, yet the logic may be faulty. The data could perhaps not lead to or justify the inferences or conclusions drawn (Cranton, 2008: 13-14).

Cranton (2008: 13-14) further asserts that critical listeners will ask themselves the following questions: Is the conclusion a certainty, or are exceptions possible? Were all cause-effect relationships established beyond doubt? Does the data justify the inference drawn or the conclusion given? Does the inference or conclusion "follow" from the data, or does it not necessarily follow? Is there evidence of strong logical thinking by the speaker? The emotional element of communication is often misunderstood and misused. To be effective critical listeners the educator and learners will carefully determine the focus of what is said by the fellow learner. The learner may appeal to any one or several needs, desires, or values that are important to fellow learners including curiosity, creativity, companionship, independence, loyalty, and sympathy, among other things.

There are several questions that educators and learners who engage in critical listening will ask themselves when assessing the emotional element. Is the speaker attempting to manipulate rather than persuade me? What is the learner's intent? Are they combining logic with emotions? Am I responding merely to the emotion? Effective critical listening depends on the listener keeping all three elements of the message in the analysis and in perspective, and these are credibility, logical argument, and emotional appeals.

Critical listening also involves critical reading. According to McClune and Jarman (2010: 727-752) critical reading is an active intellectually engaged process in which the learner participates in an inner dialogue with the writer. The learner whose critical thinking skills are facilitated realises that reading, by its very nature, means entering into a point of view other than our own, that is, the point of view of the writer. They will actively look for assumptions, key concepts and ideas, reasons and justifications, supporting examples, parallel experiences, implications and consequences, and any other structural features of the written text, to interpret and assess accurately and fairly.

- *Critical reading*

According to McClune and Jarman (2010: 727-752) critical reading refers to the process of evaluating the authenticity and validity of material and the formulation of an opinion about it, which the learner, whose critical thinking skills are facilitated, will engage in. The learner will attempt to understand the implied meaning as well as the stated meaning. They will evaluate the source from which they are reading, and differentiate the important from the unimportant, while keeping in mind the author's precepts and intention, and judge whether in drawing conclusions the author considered all the facts presented. Critical reading emphasises approaches that encourage scepticism and analysis of the text. Critical reading is the opposite of naivety in reading. It is a form of scepticism that does not take the text at face value, but instead involves the examination of claims put forward in the text, as well as implicit bias in the text. Critical reading of a text implies that the learner whose critical thinking is facilitated will engage in critical examination of the concepts used, as well as of the soundness of the arguments, and the value and relevance of the assumptions on which the text is based. The critical reader evaluates the logical consistency and organisation of the text, while approaching it with an open mind.

According to Lye (2007: 1-12) the learner whose critical thinking is facilitated will maintain an open mind and is sceptic, while at the same time constantly adjusting the degree of personal belief in relation to the quality of the text's argument. Critical reading involves thinking about the subject, moving beyond what the original text concluded to the point of how the authors reached the conclusion, and the degree to which that conclusion is accurate. Critical reading creates a learner who intentionally and habitually reads with the mental habit of reflection, intellectual honesty, perceptivity to the text, subtlety in thought, and originality in insight.

- *Freedom for creativity*

According to Longo (2010: 54-57) creativity involves the ability to generate, imagine and invent something new. It is an ability to develop original ideas; the challenges that require a divergent and different approach. It involves the redefining of previously accepted ideas by combining opposing or different concepts and new ideas and innovations will emerge. Longo (2010: 54-57) further asserts that the learning area is supposed to be a learning centre full of fun, where the most important quality required from learners is freedom of expression. By encouraging creativity in the learning area, the educator will ensure that the learner has the ability to analyse a problem and think critically without being swayed by orthodox and conventional rules.

Freedom of creativity will encourage the use of facilitated critical thinking skills by the learner to create and own ideas. The idea is to encourage learners to acknowledge the importance of assembling their own thoughts and ideas, even if they are imperfect. The educator should discourage conformity, and instead challenge the learners to think. Learners must be able to use their facilitated critical thinking skills and be capable of developing creative solutions to complex problems. The best learning environment is the one where the educator and learners have no inhibitions, and are free to form their own ideas based on the knowledge they have. Therefore, both the educator and learners should be allowed the freedom to be creative. The learners should see the educator being creative so as to learn from them, in particular in clinical practice, when things happen in the empirical world of nursing.

➤ *Trust/ Respect*

Trust is said to be an essential part of the clinical learning environment. According to Schaps (2009: 8-11) trust in the learning area allows the learners to venture into unexplored territories, both physically and cognitively, knowing that their opinions will be treated in a manner that is empathetic. Where there is trust, the learners will feel free to engage in discussions and arguments, and share ideas without fear of being judged. They will know that it is acceptable to make mistakes. A learning environment where there is mutual trust between the educator and the learners, and between the learners themselves, gives assurance to the learners that they can freely participate in the teaching/learning process, and also trust that their viewpoints will be considered and taken seriously by others without bias or prejudice.

Trust is a fundamental element of teaching/learning, for it is only through a sense of trust that the learners will embrace an empowering sense of freedom. The trust relationship between the educator and learners will enable them to exercise the freedom to take risks in the process of facilitating the learners' critical thinking. Trust will provide a sensation of collegiality that opposes the bland acceptance of the ideas and values of the 'public'. Trust challenges each learner and educator to formulate, discover, and test, their personally transforming relationships to knowledge, self, and the others through dialogue.

However, a trust relationship between the learners and the educator should be based on mutual respect. A learning environment where the learners and educator treat each other with respect provides the learner with a psychologically-safe context that allows them to think. According to Patrick and Ryan (2008: 99-124) an environment of mutual respect involves valuing one another and each other's contributions, and the learners are considerate of others' feelings. A respectful environment is associated with cognitive engagement, including the increased use of self-regulated learning strategies. This is due to psychological comfort experienced by the learner emanating from respect which frees the individual from concern about being ridiculed, thus enabling them to engage in critical thinking about the task at hand. When the learner perceives the learning area to be respectful, they will feel free to suggest and explain their ideas, even when these are tentative, without feeling constrained by what others might think or say if they are incorrect.

Such an environment is consistent with a learning environment that is conducive to facilitating critical thinking, as mutual respect is consonant with intellectual humility and open- and fair-mindedness, which are characteristics of critical thinking. Furthermore trust and respect involves an element of faith in reason (Schaps, 2009: 8-11)). According to Stapleton (2011: 14-23), faith in reason refers to the confidence that, in the long run, one's own higher interests and those of humankind at large will be best served by giving the freest play to reason, by encouraging people to come to their own conclusions by developing their own rational faculties of faith that, with proper encouragement and cultivation, the learners will learn to think for themselves, to form rational viewpoints, draw reasonable conclusions, think coherently and logically, persuade each other by reason, and become reasonable persons, despite the deep-seated obstacles in the native character of the human mind and in society as we know it.

Mata and Almeida (2014: 349-359) assert that the rational educator and learner will recognise the power of reason, and the value of disciplined thinking that is in accordance with rational standards. To develop this faith in reason is for the educator and learner to see that ultimately their own higher interests and those of others will be served best by giving the freest opportunity to reason, and by encouraging them to come to their own conclusions through a process of developing their own rational abilities.

The educator and learners will reject force and trickery as standard ways of changing another's mind. This confidence is essential to building a democracy in the learning area in which the educator and learners genuinely rule, rather than being manipulated by special interests, or by the inner prejudices, fears, and irrationalities that so easily and commonly tend to dominate their minds. The implication here is that in a learning environment where there is mutual trust and respect the educator and the learners will have faith in their reasoning abilities as the learners' critical thinking skills are facilitated through the programme.

➤ *Curiosity*

Another aspect that the empirical data describes as important is curiosity. It is one of the characteristics that the educator and learners need to have in order to facilitate the learners' critical thinking effectively. Curiosity refers to inquisitiveness, an inclination to pry, and an eagerness to learn (Oxford Advanced Learner's Dictionary, 2005).

According to Facione (1990: 9-13) the educator and learners in this programme should have an inclination to be curious and should be eager to acquire knowledge and learn explanations, even when the applications of their knowledge are not immediately apparent. The aim of teaching/learning should be to create a sense of wonder and inspire the learners' imagination towards wanting to search deeper into issues discussed in the learning environment, in order to construct knowledge for themselves while using their facilitated critical thinking skills. Inquisitiveness will propel learners towards a tendency to pry deeper into issues, with the aim of wanting to know more and getting clarity in order to take a stand.

According to Zhang and Lambert (2008: 175-181), the learners will actively construct knowledge through the use of their facilitated critical thinking skills. The constructed knowledge will enhance the learners' inquisitiveness, which will evolve into disciplined inquiry and reflection. The researcher is of the opinion that the educator should move away from superficial didactic instruction in order to awaken the learners' desire to pry.

Zhang and Lambert (2008: 175-181) further asserted that intellectual curiosity is one of the required dispositions for critical thinking. It refers to a strong desire to deeply understand, to figure things out, to put forward for consideration and assess useful and reasonable hypotheses and explanations, which is what the educator and learners in this programme should be inclined to display. Costa (2008: 99) also agreed that the learners' exposure to challenge-filled learning experiences will stimulate their interest to want to know more. Wonderment and a sense of awe are dispositions for critical thinking.

According to Facione (1990: 17) the educator should encourage the learners to be curious, irrespective of the subject matter. The learning material should be such that it prompts the learner to raise objections and questions, and point out difficulties in the educator's and fellow learners' point of view. The educator and learners should clarify, interpret, and examine the objections and questions objectively. The notion is that the learners' faith in reason disposition will be enhanced – a virtue of critical thinking. The learners will understand and come to appreciate that the point of view of others can be challenged without being confrontational or competitive.

Zhang and Lambert (2008: 175-181) also argued that the inquisitive learner is one who values being well informed, wants to know how things work, and values learning, even if the immediate payoff is not directly evident. They will seek knowledge without provocation for the intrinsic benefit of knowing. This means that the learning environment should enhance and maintain the educator's and learners' curiosity. The possession of the character traits of being curious by the educator and the learners means that their interaction involves intellectual perseverance. The inclination to pry and look for more information brings into play a tendency to intellectually persevere in order to get to the truth.

According to Peterson and Seligman (2004: 197-289), perseverance falls under the larger category of courage, because it often involves continuing along a path in the midst of and after having faced opposition and perhaps failure. Perseverance involves the ability to seek a goal in spite of obstacles, and has been shown to be a lasting trait with individual differences. In order to persevere at a task, a person must be able to suppress desires to give up and pursue an easier task, a metacognitive understanding that the end justifies the persevering means. But beyond meta-cognition, an educator and learner high in perseverance is able to overcome low self-esteem and estimations that they cannot do the task, as well as discouragement from peers and the desire to present themselves well. As a categorical psychological strength, perseverance is regarded highly by society as opposed to laziness.

On the other hand, Aberdein (2010: 165-179) states that intellectual perseverance will be exhibited by the educator and the learners through a willingness and consciousness of the need to pursue intellectual insights and truths in spite of difficulties, obstacles, and frustrations.

They will firmly adhere to rational principles despite the irrational opposition of others, and they will be inclined to a sense of the need to struggle with confusion and unsettled questions over an extended period of time to achieve deeper understanding or insight. The educator and learners will recognise that significant change requires patience and hard work, and important issues often require extended thought and research.

They have knowledge that considering a new view takes time. They will realise that impatience and wanting to “get on with it” hinders critical thinking when they most need to slow down and think carefully.

The educator and learners will be inclined to define issues or problems clearly, concepts will not be left vague and related issues sorted out. They will not say “I don’t want to think about it. It’s too complicated” or “We know what’s wrong, so let’s just fix it.” Therefore the educator should encourage the learners to gain insight into the need for intellectual perseverance.

➤ *Confidence*

The empirical data outlined that the educator is responsible for ensuring that the learners’ confidence is enhanced, because if learners are confident they will be inclined to interact openly and freely with an understanding that they too may be wrong, and they will have the freedom to reconsider their stance in an argument. According to Facione (1990: 9-13) and Smith and Roehrs (2009: 74-78) self-confidence refers to the level of trust one places in one’s own reasoning process. Self-confident learners whose critical thinking skills are facilitated will trust themselves to make good judgments, and will believe that others trust them as well, since they believe that others look to them to resolve problems, decide what to do, and to bring reasonable closure to inquiry. The educator and learners who are self-confident will exhibit an affective disposition of trusting their own reasoning skills, and seeing themselves as good thinkers. Self-confidence will dispose the educator and learners towards reasoning their way to insight, solve problems through facilitated critical thinking, and allow such thinking to persuade them and others. A tendency toward self-confidence on the part of the educator and learners whose critical thinking skills are facilitated will enable them to trust in reason, while maintaining an intellectual allowance to be persuaded otherwise.

A tendency to self-confidence goes hand in hand with intellectual courage. A self-confidence learner will have the courage to challenge their own and others’ thoughts and points of view. Furthermore a self-confidence involves an intellectual trait of humility. The educator and learners will display intellectual humility in their arguments and justification of points of view.

According to Peterson and Seligman (2004: 197, 289) intellectual courage involves what is called psychological bravery. Psychological bravery means acting against one's own natural inclinations and facing fears that might not have any societal moral implications. On the other hand Grey (2009: 353-356) asserts that critical thinkers have intellectual courage.

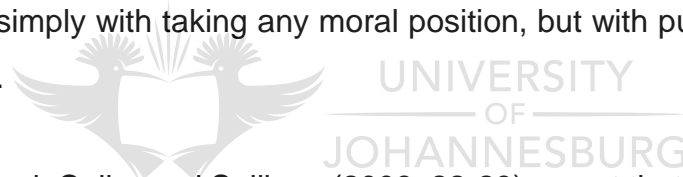
The implication is that the educator and learners in this programme have an inclination to face and fairly address ideas, beliefs or viewpoints towards which they have strong negative emotions and to which they have not given a serious hearing. The educator and learners in this programme are further assumed to have intellectual humility. According to Spiegel (2012: 27-38), intellectual humility involves an awareness of the limits of one's individual knowledge, including sensitivity to circumstances in which one's native egocentrism is likely to function self-deceptively, and a sensitivity to bias, prejudice to and limitations of personal viewpoints. Intellectual humility is based on the educator and learners recognising that they should not claim more than what they actually know. However, it does not imply submissiveness. It implies the lack of intellectual pretentiousness, boastfulness, or conceit combined with insight into the strength or weaknesses of the logical foundation of their beliefs.

Spiegel (2012: 27-38) further asserts that intellectual humility on the part of the educator and learners implies insight into the foundations of their individual beliefs: knowing what evidence they have, how they have come to believe, and what further evidence they might examine or seek out. Therefore, the educator and learners will distinguish what they know from what they don't know. They will not be afraid of saying "I don't know" when they are not in a position to be sure. They can make this distinction because they habitually ask themselves, "How could one know if this is true?" To say "In this case I must suspend judgment until I find out all the necessary information", does not make them anxious or uncomfortable. They are willing to rethink conclusions in the light of new knowledge. They qualify their claims appropriately (Spiegel, 2012: 27-38)

➤ *Integrity*

The respondents also cited integrity as another characteristic that is vital to the learning environment that is conducive to facilitating critical thinking. According to the Stanford Encyclopedia of Philosophy (2009), ordinary discourse about integrity involves two fundamental intuitions: first, that integrity is primarily a formal relation one has to oneself or between parts or aspects of one's self; and second, that integrity is connected in an important way to acting morally. In other words, there are some substantive or normative constraints on what it is to act with integrity. Integrity refers to the quality of a person's character.

According to Lunney (2010: 82-88) the educator and learners in this programme will demonstrate integrity by embracing a moral point of view that urges them to be conceptually clear, logically consistent, appraise relevant empirical evidence, and be cautious about acknowledging and weighing relevant moral considerations. The educator and learners with integrity will impose these restrictions on themselves, since they are concerned not simply with taking any moral position, but with pursuing a commitment to do what is best.



On the other hand, Colby and Sullivan (2009: 22-29) assert that an educator and learner with integrity will stand up, unhypocritically, for their best judgment, while respecting the judgment of others. They argue that integrity is primarily a social virtue, one that is defined by a person's relations to others. The social character of integrity is a matter of the educator's and learners' proper regard for their own best judgment. The educator and learners of integrity do not just act consistently with their endorsements, they stand up for their best judgment within the learning environment during the teaching/learning interaction. Furthermore, they have to display intellectual integrity as a characteristic.

According to Spiegel (2012: 27-38) intellectual integrity refers to the recognition of the need to be true to one's own thinking, and to be consistent in the intellectual standards. The educator and the learners will hold themselves to the same rigorous standards of evidence and proof to which they hold antagonistic views. They should practice what they advocate for others. They will honestly admit discrepancies and inconsistencies in their individual thoughts and actions.

The educator and learners in this programme believe most strongly in what has been justified by their own thought and their analysed experience. They are committed to bringing the self they are and the self they want to be together. They are aware that people are generally inconsistent in their application of standards once their ego is involved, either positively or negatively. For example, when people like us, we tend to over-estimate their positive characteristics; when people dislike us, we tend to underrate their positive characteristics (Spiegel, 2012: 27-38).

According to Lunney (2010: 82-88) the educator and learners with intellectual integrity will exhibit intellectual virtues such as intellectual humility, perseverance, adaptability, and communicativeness. Possession of these virtues is part of what it means for the educator and learners to have intellectual integrity, although they may exist in varying degrees without undermining their overall intellectual integrity. The educator and learners with intellectual integrity will refuse to suppress counter-arguments, and consistently acknowledge help. Lunney (2010: 82-88) further asserts that the importance of appropriate reflection to intellectual integrity indicates that, like personal integrity, intellectual integrity is closely related to self-knowledge. Self-knowledge appears essential to integrity in general, and given that intellectual integrity concerns knowledge, there appear to be a relationship between having intellectual integrity and self-knowledge.

This close relationship might lead one to assume that self-deception is contrary to intellectual integrity because it undermines self-knowledge, such as knowledge of our intellectual strengths and capacities, (Colby & Sullivan, 2009: 22-29). On the other hand, Dunne and Hogan (2004: 54) argues that the educator and learners with intellectual integrity will display an inclination to openness, and an openness to criticism and to the ideas of others. An account of intellectual integrity should recognise other sources of conflict and temptations that impede intellectual integrity. The educator and learners will display intellectual virtues central to their conception of intellectual integrity, such as honesty, courage, fairness, sensitivity, perceptiveness, and insightfulness.

The implication is that these intellectual traits will assist the learners to develop insights that shape their basic skills of thought. They will come to realise that different people think from divergent premises, assumptions, and ideas, and will learn to entertain them. The learners will gain courage to face their own prejudices and ignorance.

They will be able to empathise with, and reason within points of view towards which they are hostile. They will also learn to treat opposing views fairly. Therefore, in the learning environment that enhances and facilitates critical thinking, the major supportive mechanism is the educator's attitude. Critical thinking will be facilitated where the educator has a favourable attitude towards critical thinking, and is strongly dedicated to facilitate such thinking in the learners.

The learning environment should be a place where the values of critical thinking (truth, open-mindedness, empathy, autonomy, rationality, and self-criticism) are encouraged and rewarded (Lunney, 2010: 82-88). In this environment the learners learn to believe in the power of their own minds to identify and solve problems. They will learn to believe in the efficacy of their own facilitated critical thinking. Thinking for themselves is not something they will fear engaging in. The educator will not be the one who tells them the correct answers, but the one who encourages and helps them to figure out answers for themselves, and who encourages them to discover the powerful resources of their own minds.

In this learning environment the educator is more of a questioner than a preacher. The educator asks questions that probe meanings, that request reasons and evidence that facilitate elaboration, and that keeps discussion from becoming confusing. Questions in this environment should provide incentives for listening to what others have to say (Smith & Roehrs, 2009: 74-78). Furthermore, it could be concluded that for the educational environment to facilitate critical thinking the educator should ensure that there is continuous mutual support between the learners and themselves. The relationships should be such that there is empathetic collaboration, open-minded interaction, and a disposition to self-assessment and self-criticism by both the educator and learners. The learning environment should enhance a feeling of safety, with affirmation of each learner to be a critical thinker as their skills are facilitated. The learners' confidence should be built by treating them as partners in learning. Sound relationships should be continually maintained and monitored.

The learner-learner and learner-educator relationships should promote positive attitudes and appreciation of others. The learners should be actively engaged in the teaching/learning process and respond to the needs of others. This open and non-threatening teaching/learning environment is ideal for the facilitation of critical thinking. There should be the use of self-correction and monitoring to judge the rationality of thinking, as well as reflexivity.

When using critical thinking, individuals step back and reflect on the quality of their thinking. Critical thinking involves complex mental operations that cannot be broken into discrete styles of thinking. It involves the learners' total intellectual functioning and not a narrowly defined set of skills. The value of these character traits and the integrated intellectual traits is that they will enhance the facilitation of the learners' critical thinking skills by the educator while enabling the development of critical thinking by the learners through the programme.

4.2.3 Dynamic

The dynamic refers to the driving force behind facilitating critical thinking in this programme. It is said to be the interactive forces that produce or control movement in any field or system (Garrison, Cleved-Innes & Fung, 2010: 31-36). Participants identified interactive facilitation as the main driving force underpinning the facilitation of critical thinking.

Figure 4.3
The Dynamic

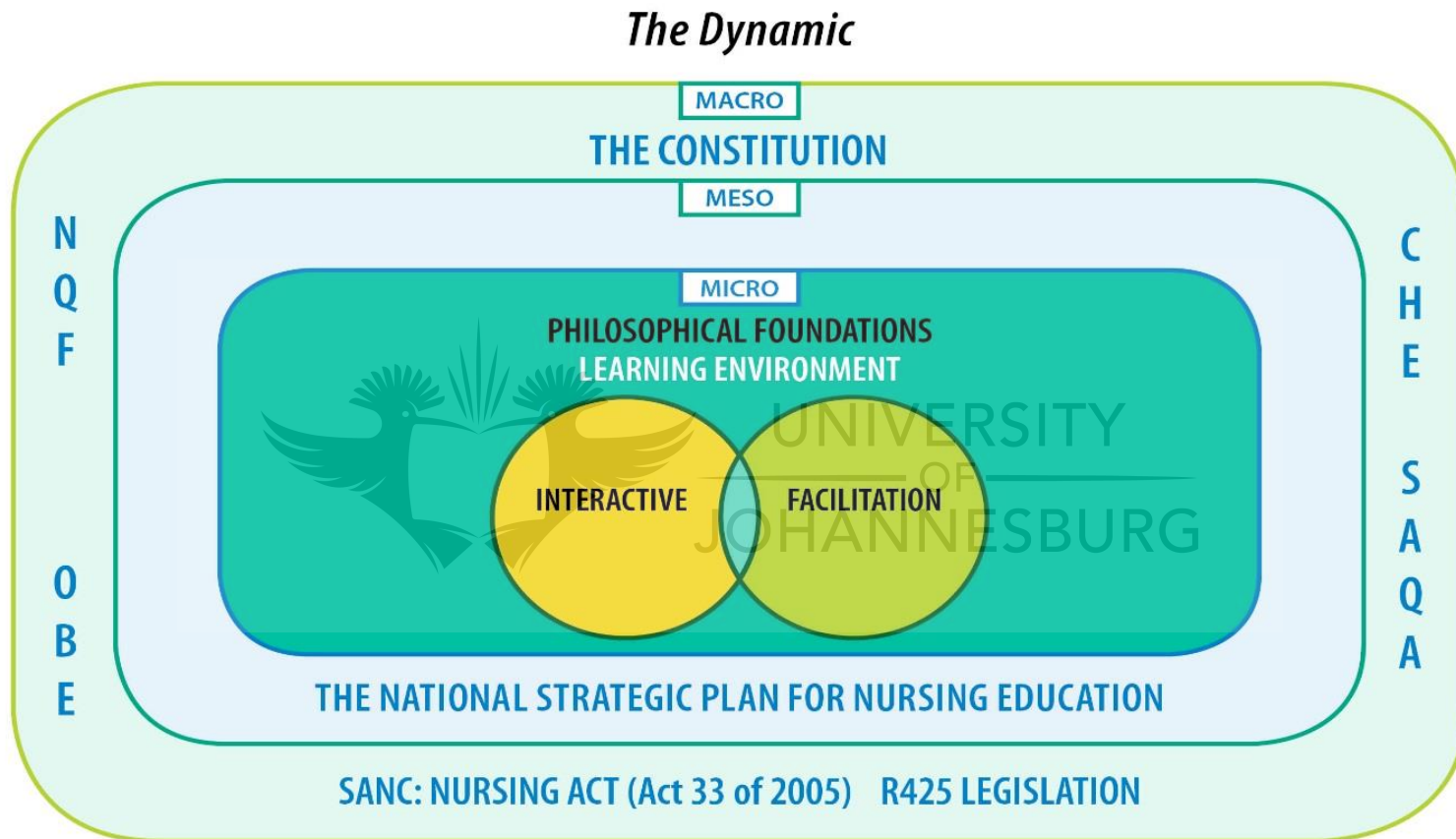


Figure 4.3 is a depiction of the context and the dynamic. Through their characteristics the agent and the recipient collaborate and co-operate using dialogic through the interactive facilitation process of the learners' critical thinking. Interactive facilitation is the central point of facilitating critical thinking. The learners' active participation in their learning through collaborative, dialogic co-operation is a vital factor. Aspects of the dynamic are conceptualised below.

4.2.3.1 Interactive facilitation

Interactive facilitation refers to holistic and mutual involvement between the educator and learners in an integrated manner in the learning environment with a quest to facilitate the learners' critical thinking skills. Interaction refers to mutual, reciprocally active, interchangeable, and purposeful involvement in the learning environment. Facilitation is concerned with making it possible for the learners through a process which makes it easier for them to achieve the goal of the envisaged programme, which is critical thinking. The skills involved in the facilitation process are primarily dependent on the task of facilitating the critical thinking skills of the learners, as well as the interactive facilitative skills of the educator (Bruce et al, 2011: 75). The success of the interactive facilitation between the educator and the learners is dependent on the characteristics of the educator, which are:

- demonstrating respect for the learner and the process of facilitating learners' critical thinking skills;
- establishing a climate of trust with the learner;
- identifying through active listening the learner's needs in relation to facilitating their critical thinking skills;
- using teaching/learning strategies that are congruent with facilitating critical thinking;
- encouraging learners to use their initiative and to accept or reject proposals according to their relevance and appropriateness;
- encouraging learners to reflect on their own and others' verbal and non-verbal behaviour and to bring meaning into the learning situation;

- challenging learners' behaviour, beliefs, and attitudes when these appear to hinder facilitating their critical thinking skills;
- encouraging learners to release or act out their feelings (Adapted from Bruce et al, 2011: 75).

A collaborative and interactive learning environment, as opposed to a passive learning environment is found to be able to facilitate learning more meaningfully. The learning environment should allow for innovative seating arrangements to encourage the learners to take a more active and collaborative role in the facilitation of their critical thinking. Interactive facilitation enable the learners to work together, share ideas and collaborate which enhances a sense of citizenry and being connected to the content (Billings and Halstead 2012: 412). The design of a learning environment must provide a safe and comfortable space, in which learners are willing to share information and in which they can also easily communicate with others. For instance, the pedagogical design of an interactive learning environment can make content meaningful, authentic, and relevant to learners and allow learners to add further resources to share in addition to those suggested by a teacher in the facilitation of their critical thinking skills. The advantages of facilitated learning are an increase in learners' interest, increases acceptance and commitment. It utilises student knowledge and experience. Furthermore it results in more permanent learning because of a high degree of student participation (Wang, 2008: 411-419).

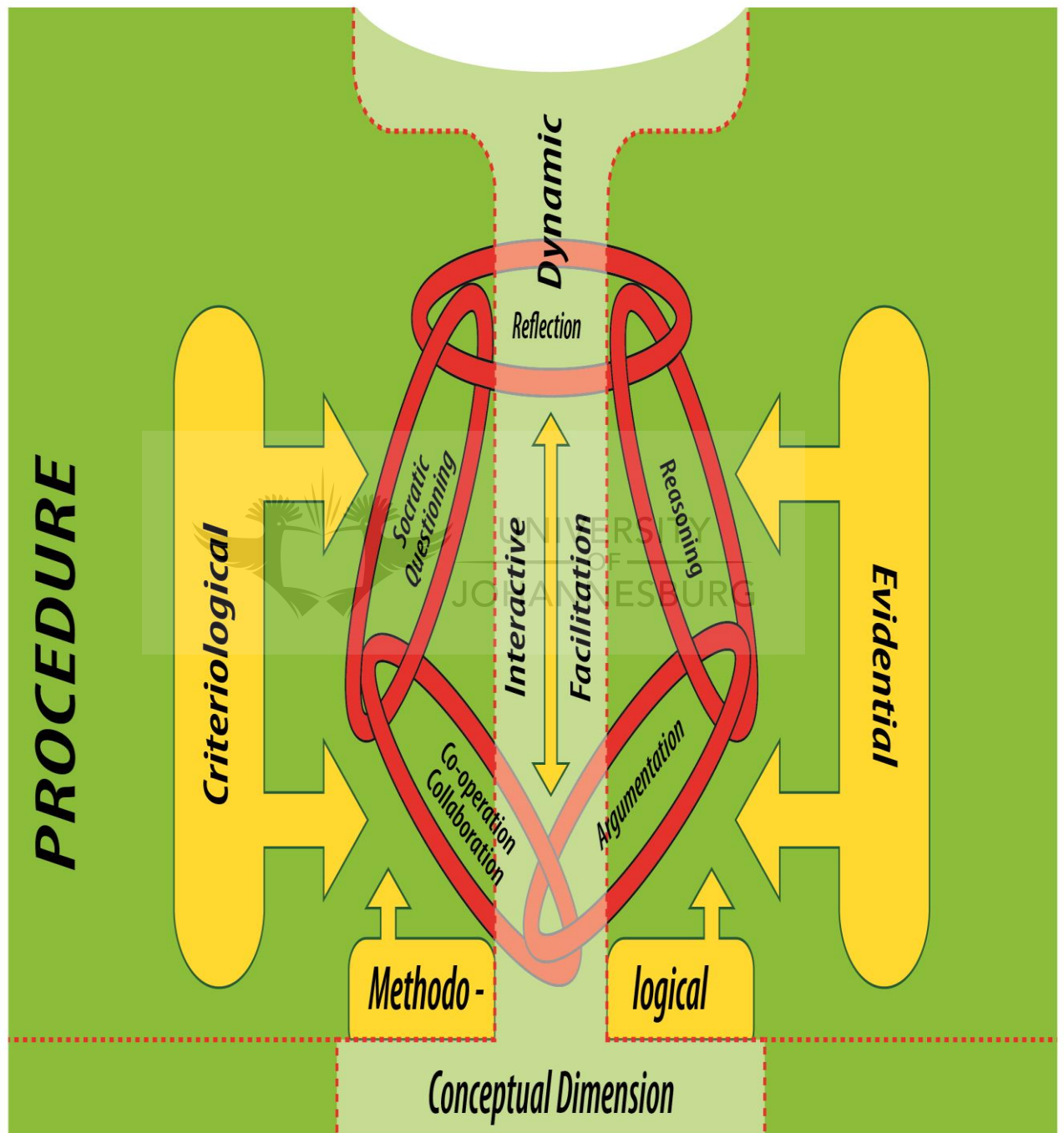
4.2.4 Process/ procedure

In the context of this study the procedure is according to the critical thinking framework derived from the definition by Facione (1990: 9-13), which includes conceptual, methodological, evidential, and criteriological dimensions of critical thinking. The procedure refers to an array of interrelated activities used to facilitate the learners' critical thinking. These activities constitute the educational process that will be followed to develop the envisaged programme. The methodological component drives the procedure to facilitate critical thinking as influenced by the evidential and criteriological components. The conceptual component of the framework forms the foundation on which critical thinking has to take place, since critical thinking cannot take place in a vacuum (Facione, 1990: 9-13).

The conceptual framework of the programme in Figure 4.4 depicts the procedure for critical thinking which includes the conceptual, methodological, evidential, and criteriological dimensions of the critical thinking framework as the context was described. The procedure is the steps used to facilitate the learners' critical thinking skills through collaborative, dialectic, and dialogical interaction in the clinical nursing education environment. The steps will be described as according the conceptual framework depicted in the Figure 4.4.



Figure 4.4
Conceptual framework of the procedure



4.2.4.1 Conceptual Dimension

The participants cited conceptual, interdisciplinary, foundational and procedural knowledge as the types of knowledge that are necessary for critical thinking to take place. As thinking takes place in concepts, it means that there is a need for the learners to be taught concepts of the domain within which their critical thinking is facilitated. According to Raghubar, Barnes, Steven and Hecht (2010: 110-122) the knowledge base in any individual's cognitive structure is made up of different types of knowledge. The most popular and well known type is conceptual and procedural knowledge. They further assert that knowledge is characterised by different qualities, for example the level (deep or surface), generality, the level of automatisisation, modality, and the structure of knowledge. The different types are domain-specific knowledge, conceptual knowledge, and procedural knowledge. Domain-specific knowledge includes conceptual knowledge and procedural knowledge whereby conceptual knowledge is compiled into functional units that incorporate domain-specific strategies.

According to Schneider and Stern (2010: 178) different types of knowledge are needed to carry out the reasoning involved in reflective thinking. These include conceptual knowledge, procedural knowledge, and metacognitive knowledge. These types of knowledge are closely interrelated, and for effective learning to occur, all three are necessary. The learner whose critical thinking skills are facilitated will use conceptual, inter-disciplinary, foundational, and procedural knowledge. Such knowledge is used to make meaning in the construction of own knowledge by the learner while their critical thinking is facilitated.

a) Conceptual Knowledge

Domain specific knowledge includes concepts, statements, principles, and theories which form a basis that is used as a conceptual framework from which concepts are drawn during thinking. Critical thinking also includes critical thinking concepts that are used during thinking, and some of these concepts are abstract while others are concrete. Conceptual knowledge is linked to the content within which the critical thinking skills are infused.

The educators who were interviewed during the empirical data collection were of the opinion that it is important to teach the learners concepts of a particular domain so that they can use them as a frame of reference during the facilitation of their critical thinking.

According to Billings and Halstead (2012: 221-222) conceptual knowledge refers to the learners' representation of the major concepts in a system that includes facts and verbal information. It is knowledge that consists of concepts, definitions, statements, categories, principles and theories. Conceptual knowledge is defined as knowledge of facts, properties, and relations in specific domains. It can be thought of as a connected web of knowledge, a network in which the linking relationships are as prominent as the discrete pieces of information. It is the interrelationships among the basic elements within a larger structure that enable them to function together. For example, in the context of this study the conceptual knowledge could be concepts and facts that form knowledge networks or schemas such as anatomy and physiology of the various systems, medical conditions that are related to this system, microbiology, physics and chemistry. For skilled critical thinking conceptual knowledge is not utilised on its own, the learners will also use strategies or procedures for applying this knowledge, a process called procedural knowledge.

- *Concepts*



Mouton (2009: 181) asserts that concepts are symbolic constructions by means of which individuals make sense of and attribute meaning to their world. Concepts are cognitive units of meaning, abstract ideas or a mental symbols sometimes defined as units of knowledge. They are the mental representation of ideas, although abstract concepts do not necessarily appear in the mind as images. Concepts are mental images of reality and ideas about events, objects, and properties. They involve two kinds of reality, which are properties or the way things are, and processes or the way things occur (Wilkinson, 2011:25).

Concepts are considered to be the building blocks of language, therefore the language used in the learning area should be one that enhances the learners' critical thinking skills. Concepts are formed by generalising from personal experience, impressions, theories, and other knowledge. A generalisation is the relationship between two or more concepts.

According to Kormos, Kiddle and Csizer (2011: 495-516) concepts are bodies of knowledge that are stored in the long term memory, and are used by default by our cognitive processes when we categorise, make inductions, understand languages, and drawing analogies among other cognitive processes.

They are divided into concepts of classes of physical objects, concepts of substances, concepts of events, and abstract concepts. A concept of a given class is a conscious representation of the class, be it an image or an imageless mental representation. Alternatively, this conceptual knowledge that is considered during the facilitation of the learners' critical thinking could be verbal concepts that include classes of ideas or objects, or non-verbal concepts that are best understood by making a mental picture to represent their critical attributes, or visualisation, and lastly process concepts that represent mechanisms such as for an example, the mechanism of respiration (Kormos et al. 2011: 495-516).

Concepts are stored in schema. Knowledge of a particular domain is arranged in schemata that are tailored to typical task performance in the domain, and organised in a systematic hierarchical manner. A schema will typically contain the different types of concepts required for task performance, for example it could be a schemata containing conceptual and procedural knowledge, ready to be retrieved during the facilitation of the critical thinking process of the learners. Rand (2011: 97-98) also asserted that schemata of known systems that are components of knowledge are formed by concepts. The learners will form concepts by mentally isolating a group of concrete and distinct perceptual units on the basis of observed similarities that distinguish them from other known concepts. Through a cognitive process of omitting, similar concepts will be integrated into a single new mental unit that forms a conceptual knowledge base that will be consulted by the learner when there is a need during the use of their facilitated critical thinking skills.

The integrated units of concepts are stored in the mind using a selection of perceptual symbols (words) to designate them. The learner will retrieve these concepts by using their facilitated critical thinking skills to reason, identify similarities and differences, and abstract them into concepts, draw inferences, and reach conclusions.

According to Burns and Grove (2009: 126) concepts are terms that abstractly describe and name an object or phenomenon, thus providing it with a separate identity or meaning. At a higher level, concepts have general meanings and are referred to as constructs. They are used to express relationships, to classify novel entities and to draw inferences. Through concepts, apparently unrelated observations and phenomena are integrated into viable hypotheses and theories. They bear non-arbitrary relationships to features, frequencies, and correlations, as well as providing explanations of those frequencies and correlations. Concepts embody systematic sets of beliefs. They are used to construct theories and models. Furthermore, concepts serve a function of categorisation and correcting linguistic meaning. Above all, concepts form the basis of conceptual knowledge.

According to Parameswaran (2010: 43-51) in order to understand a concept, the learner goes through a cognitive process involving the concept (adding or composing functions, evaluating a function at a point) or representations of the concept, for example a graph of a function. The learner will then develop images out of this mental action, a process called image-making, and will refine and manipulate the image. A concept image is regarded as the cognitive structure consisting of the mental picture, properties, and processes associated with the concept. Dewey (1998: 150) posited that concepts are important for our thinking processes, as firstly they enable the learner whose critical thinking is facilitated to generalise meaning, to extend their understanding of one phenomenon in a particular context and to transfer it to another context. Secondly, concepts standardise the learners' knowledge because they stabilise meaning and maintain constancy even in different contexts, for example, when learners reach an understanding and consensus on an issue, it is said that they have reached an agreement or settlement.

According to Dewey (1998: 151-152) this is an indication that standardisation and the stable meaning of concepts are a condition of effective meaning. Concepts will also help the learner to identify the unknown and to supplement the present. This means that the learners will use concepts as instruments to identify, supplement, and place an object or issue in a system.

Therefore, concepts have an educational significance in that they aid the learner to create meanings that are general and applicable in a variety of instances, despite their differences that are constant, identical, or uniform in what they refer to, and that are standardised known points of reference from which learners gain understanding and form knowledge construction when they are faced with uncertainty and lack of knowledge.

Kiefer and Pulvermuller (2012: 805-825) also assert that conceptual knowledge enables the learner whose critical thinking is facilitated to evidence the more important concepts, and possibly those of lesser importance, with a clear and direct model of what is important in assessing and analysing a problem under discussion, and what is secondary or complementary. It enables them to demonstrate relationships between concepts that are usually never directional. It further stimulates them to analyse the network that constitutes the conceptual core of a topic, in order to make inferences at a later stage, even though it is non-explicit at times. For example, the learner could have concepts such as shortness of breath, cyanosis, tachypnoea, and tachycardia as a network that they could draw inferences from later on as they reason about problems that need to be solved. The learner will also use concepts to connect precedents with the experience that they may have gathered in the learning area through their facilitated critical thinking skills.

Concepts enable the learners to identify and create new relationships that they may consider relevant to personal learning. They will be encouraged to reach an in-depth insight into the concepts beyond relationships, while strengthening their understanding with text and images that directly influence the creation of meaningful knowledge of the content, interpretation of information as discovered, and procedures and knowledge references directly linked to the concepts under consideration. Furthermore, it enables the learners to search for descriptive texts of concepts, deepening, recognising secondary concepts, and acquiring holistic knowledge. Finally, the learner will be encouraged to adapt representations to their own conception, as is required by the cognitive necessity for critical thinking skills.

According to Hiebert (2013: 113, 182, 265), during the process of using concepts the learner will exhibit the use of their facilitated critical thinking skills, by evidencing the more important concepts with a clear and direct representation of what is important and the relationships between the concepts.

The use of the stored concepts will enable the learners to connect their facilitated critical thinking skills to their prior experience, which will aid them in creating new conceptual relationships that are considered relevant to their personal learning. The use of conceptual knowledge will encourage the learner to reach deeper insights, strengthen their understanding with texts, arguments, points of view, and influence the creation of meaningful knowledge and the explanation of facts.

The learner will use their facilitated critical thinking skills to move up the conceptual hierarchy, from the fact that underpins the conceptual model, to the concept that organises the facts, to the theories that tie the concept together, and to the model that integrates the strands of the explanatory theory into a coherent system.

- *Definitions*

According to Mouton (2009: 187) definitions are statements that delimit or demarcate the meaning of a word in terms of its sense or reference. On the other hand, definitions are passages that explain the meaning of a term, concept, phrase or other set of symbols. A term may have many different senses or meanings. According to the Stanford Encyclopaedia of Philosophy (2009: 1-28) the term to be defined is called a *definiendum*, and a *definiens* is a cluster of words that defines the term. Definitions include denotations and connotations. The function of definitions is to set out the essential attributes of the term that is defined. Definitions present a list of characteristics that convey a particular idea about a concept or term. They explain the meaning of a term that may be obscured. Definitions serve a function of enhancing precision and clarity.

On the other hand, Dewey (1998: 160) asserts that the process of arriving at units of meaning is definition, whereby the intention of the concept is the meaning that exclusively and characteristically attaches to those concepts. Oren (2011: 142-151) proposes five basic rules to be observed in the formulation of definitions and the learner should be aware that the formulated definitions should subscribe to these rules.

Definitions must indicate the key characteristics that are associated with the concepts, but must focus specifically on the characteristics that are unique. A definition cannot be circular, which means that a concept cannot be defined by itself.

A definition can neither be too broad, nor too narrow. It must not include too many or too few characteristics that are normally associated with the concept. Definitions must not employ figurative language, as the objective of a definition is to make a concept clear. Therefore the learner whose critical thinking is facilitated should ensure that the formulation of definitions is clear, precise, and comprehensible. Furthermore, definitions must not be formulated negatively. The definition is to tell what one should understand by a concept and not what a concept is not, for example one cannot say “hypothermia is not an elevated temperature”.

Mouton (2009: 187-189) states that definitions present a list of characteristics called descriptors, which convey a particular idea, namely what is meant by the concept. It enables the learner to identify those entities in the real world that are included under the class of the defined concept. Definitions are divided into connotative, denotative, and theoretical definitions. The connotative meaning of a concept refers to the general intention or idea usually referred to as a theoretical or connotative definition. A theoretical definition brings into focus the relationship between a given concept and related concepts within a specific conceptual framework (model or theory). The denotative meaning of a concept refers to what is called an operational definition.

Operational definitions describe certain operations, usually some type of measurement under which the use of the concept is valid. An operational definition presents specific conditions for the appropriate use of a specific concept, conditions that state that the execution of certain operations will result in specific results. Operational definitions of concepts involve a move from the abstract to the concrete. The process of operationalising a concept aims at identifying the indicators, the specific events or phenomena that truly represent the abstract concept. A good definition leads to clear and unambiguous conceptualisation, which is the role of theoretical definitions, and measurement of phenomena, which is the function of operational definitions (Mouton, 2009: 187-189).

Dewey (1998: 161-164) refers to three types of definitions. These are denotative, expository, and scientific. The denotative and the scientific definitions are said to be logically important, while the expository type is said to be socially and pedagogically important as an intervening step.

Dewey (1998: 161-164) proposes that the denotative meaning of a concept is required for all sense qualities, for example sound, emotional and moral qualities, and such definitions involve personal experience on the part of learner, for example, understanding of content or a new aspect of the content must always be experienced through acts either directly, or in imagining the existence of the quality in question.

Furthermore, expository definitions have to do with meanings that have been directly or denotatively identified, with language becoming a resource by which imaginative combinations and variations may be built up. Scientific definitions select conditions of causation and generation as their characteristic material. Scientific definitions outline the manner in which certain things are causally related to other things – which denotes a relationship.

According to Kaplan (2009: 281-288) the concept of a definition does not in itself provide a logical account. The process of inquiry is an abstraction from particular inquiries so that a given concept has various meanings in different contexts. Specification of definitions is a process that is hypothetical and provisional and undergoes modification as inquiry proceeds. Definitions enable the learner to identify and retain a concept and establish relationships, the hierarchy and integration of all the concepts, and thus integration of knowledge. Janssen, Krol, Schielen and Hoekstra (2010: 229-238) are of the view that the important component of expert knowledge is knowledge of the defining properties of concepts. It then becomes important that the learners in this programme distinguish between defining properties of concepts and assertional knowledge of concepts.

Janssen et al. (2010: 229-238) also define inductive definitions as those definitions that define a relationship or a collection of relationships that are outlined through a cognitive process that defines new instances of the relationship. The aim of inductive definitions is to define its defined predicates. Definitions provide the learner with a basis for comprehension and facilitates comprehension of important explanations in general and of phenomena.

Definitions also facilitate problem-solving and create a common language in dialogue between the educator and learners. Definitions can also be used to probe several aspects of the specific and general meaning of conceptual knowledge.

Furthermore, definitions are said to reflect the disciplinary content (ontological meaning), epistemic content (relationship to measurement), and syntactic information of content – its conceptual structure and relationship between concepts (Lehavi & Galili, 2011: 1-5).

- *Statements*

According to Mouton (2009:192) descriptive or factual statements make a claim about what really is the case. They are divided into descriptive statements according to the number of cases covered by a description, and number of variables included in a description or level of measurement. Descriptive statements may range from singular propositions to general propositions or generalisations. They may also range from over one (univariate) or many (multivariate) characteristics of the concept under consideration. Lastly, descriptive statements may be qualitative or quantitative depending on the level of measurement. In qualitative measurement the relational statement describes the instances and classifies them together, and quantitative measurement describes correlational instances, which are expressed in numerical values.

On the other hand, explanatory statements make a causal claim, which include the singular causal judgment, the generic causal relationship, the causal relevance claim, and probabilistic causal claims. Burns and Grove (2009: 131-134) assert that being the core of the framework, the purpose of relational statements in a framework is to determine the objectives, question, or hypothesis formulated. Relational statements may be expressed in a literary manner as sentences, or in a diagrammatic form as a map or mathematical form (as an equation). A direction of relationship may be positive, negative, or unknown, for example a positive direction implies that as one concept changes the other also will change in the same direction. Shape refers to a linear relationship whereby the relationship between two concepts will remain consistent regardless of the values of each concept. The strength of a relationship between statements is the amount of variation explained by the relationship, while a symmetry relationship is complex and contains two statements. The learner will use relational statements to clarify the type of relationship that exists between concepts.

- *Categories*

According to Mouton (2009: 187), categories are groups of concepts or objects based on their similar properties, which are mutually exclusive and collectively exhaustive. The process of categorisation implies that ideas and objects are recognised, differentiated, and understood. Categorisation is fundamental in language, prediction, inference, and decision-making. The function of categories is to illuminate a relationship between subjects and objects of knowledge. There are three approaches to categorisation, these are classical categorisation, conceptual clustering, and prototype theory. Classical categorisation involves grouping of objects based on their similar properties. Categories should be clearly defined, mutually exclusive, and collectively exhaustive. Conceptual clustering is derived from attempts to explain how knowledge is represented. Clusters are generated firstly by formulating their conceptual descriptions, and then classifying the entities according to the description.

The task of clustering involves recognising inherent structures in a data set, and grouping objects together into classes according to their similarity. It is a process of generating a classification structure. Conceptual clustering is a learning paradigm for unsupervised classification; it distinguishes the ordinary data clustering by generating information hierarchy.

According to Bowen (2008: 137-152) conceptual categories have to do with inference of unobserved properties. Conceptual categories are useful because they allow the learner to infer objects' unobserved properties from the observed properties. The observed properties enable the learner to assign the object to a category, for example when a patient experiences difficulty in breathing, the learner will infer unobserved symptoms from observed ones to assign the phenomenon to the category of respiratory diseases. Classical categories refer to inferences within idealised lawful systems. Examples of classical categories are scientific and mathematical laws. Laws are captured in formal systems that could be a symbol manipulation system consisting of a set of propositions and a set of inference rules that apply to the propositions by virtue of their form alone.

Prediger (2008: 3-17) asserts that the learner's ability to discriminate and assign objects to categories is involved in their cognitive activities such as perception and memorisation. The classification of items into categories enables the learner to apply their knowledge about the item to a category, and this is referred to as generalisation. Prediger (2008: 3-17) further distinguishes between five levels of categorisation that range from the lowest to the highest level of abstraction.

These levels are simple discrimination, categorisation by rote, open-ended categories, functional or conceptual categorisation and categorisation of abstract relations. In the level of categorisation by rote, the learner is stimulated to discriminate and memorise an arbitrary list in which classification criteria are dependent on contingency rules. In the open-ended categories, the learner uses rules to sort objects' behaviour. Such rules are based on some principle of perceptual similarity, which is generalised to elements of the same kind. The conceptual categorisation level involves abilities that go beyond similarity between examples of a class. Objects are sorted on the basis of some functional similarity. Categorisation of abstract relationships deal with relationships between and among concepts. Perceptual cognitive processes correspond to the different levels of categorisation.



- *Principles*

A principle is a law or rule that has to be true or usual. It is to be followed, or is an inevitable consequence of something. A principle can be some existing factor in nature or a logical proposition or judgment (principle of reason) that is a starting point of a valid argument. It is a term for an established relationship between two or more factors (Woolfolk 2010:16).

According to van Aalst (2009: 259-287) principles are concepts judged to be common to all domains of metadata, and which might inform the design of any metadata schema or application. Johnson (2011: 267-269) asserts that principles specify the ideals the learner chooses to realise. They are divided into principles of how to do something (process), and those for what to make (product). The value of following principles is intrinsic consideration of efficiency, effectiveness, or anything else that can override the applicability of a principle.

According to Black (2009: 1-7) a principle is said to be a fundamental cause or universal truth, that which is inherent in anything. Principles are divided into principles of non-sufficient reason, principles of sufficient reason, and principles of process. According to the principle of non-sufficient reason, the probability of two propositions may be said to be equal if there is no adequate ground to declare them unequal.

The principle of sufficient reason refers to one of the two principles on which reasoning is founded; the other being the principle of contradiction while the latter is the ground of all necessary truth. The principle of sufficient reason is the ground of all contingent and factual truth. It applies to existents, possible or factual, hence it forms actual sufficient reasons. The principle of sufficient reason is the principle by virtue of which the learner will judge that no fact can be found to be true or existent, no judgment veritable unless there is a sufficient reason why it should be so and not otherwise, although these reasons can, more often than not, be known to them, as nothing happens without a reason. The principle of process denotes a process of advance from an unordered state of affairs to a unique occasion of togetherness. Many disjointed entities become one new actual entity, distinct from the many it unifies. Principles of understanding are derived from pure concepts and not from intuition, because the pure understanding is a faculty of concepts.

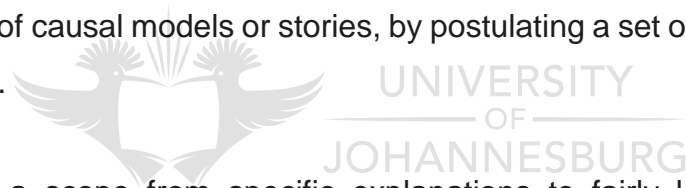


- *Theories*

According to Kerlinger (in Mouton, 2009: 198) and Lee, McLoughlin and Chan (2008: 501-521) a theory is a set of interrelated constructs (concept), definitions, and propositions that present a systematic view of phenomena by specifying relations between variables, with the purpose of explaining the phenomena. They are analytical tools for understanding, explaining, and making predictions about a given subject matter. A theory is a formulation of an explanation of a phenomenon. This means that all explanations involve suggesting a universal law or theory from which the learner deductively derives the explanatory statement, which is the statement describing the phenomenon to be explained. Theories are more internally consistent than common sense.

Burns and Grove (2009: 139) argue that a theory consists of an integrated set of defined concepts, existence statements, and relational statements that present a view of a phenomenon and can be used to describe, explain, predict, and control that phenomenon. The function of theories is to make clear, consistent predictions, summarise and organise information. Theories assist with the systematic collection of data and the careful analysis of data patterns. They give individual facts meaningful context. Theories explain a broad range of phenomena with a few principles. Based on the above description and functions, it means that conceptual knowledge is an array of concepts, definitions, relational statements, categories, principles, theories, and systems that are stored in the long term memory. They form the conceptual knowledge basis, which is retrieved during thinking.

According to Nakamori, Wierzbicki and Zhu (2011: 15-39) theories are a contingent explanation of causality. It helps the learner who observes phenomena under various circumstances to understand why things turn out the way they do, and to predict with confidence what actions or events will lead to what results under each different circumstance. On the other hand, Mouton (2009: 202) is of the opinion that theories explain by way of causal models or stories, by postulating a set of processes that account for phenomena.



Theories have a scope from specific explanations to fairly large-scale theories like Vygotsky's (1978: 57) constructivistic theory, which involves constructivism as an aspect. Constructivism suggests that knowledge is constructed by learners through an active, mental process of development. They are the builders and creators of meaning and knowledge. By definition, constructivism makes reference to four principles: learning, in an important way, depends on what the learner already knows; new ideas occur as they adapt and change their old ideas; learning involves inventing ideas rather than mechanically accumulating facts; and meaningful learning occurs through rethinking old ideas and coming to new conclusions about new ideas that conflict with old ideas.

The learner in the envisaged programme will have their intellectual autonomy encouraged. The learners' curiosity is nurtured and they will engage in dialogue with other learners to collaboratively construct knowledge as their critical thinking skills are facilitated.

They will exercise metacognition, self-evaluation, self-regulation, reflection, and awareness. Therefore the learner will use their conceptual knowledge, be it concepts, clusters of concepts or categories, definitions, statements, principles, and theories that are drawn from their cognitive structures to attach meaning to the problem as presented. The concepts are compared and contrasted with the problem they are presented with, in order to identify and analyse. In the process of analysis, while applying the related sub-skills of analysis, the learner will attempt to make meaning of the problem while drawing on the conceptual knowledge they have in their cognitive structures. This knowledge is also be used to argue and examine their fellow learners' arguments and justify the reasoning behind the conclusions they arrive at. This type of knowledge is used throughout the steps of solving problems.

They will interpret, draw inferences, evaluate, and explain their reasoning, coupled with understanding the reasoning of fellow learners and the actions undertaken, as well as self-regulation activities that involve self-examining and self-correction. The process of identifying and drawing from their conceptual knowledge is coupled with the use of interdisciplinary knowledge that is drawn from related disciplines to make sense of the problem at hand.



b) Interdisciplinary knowledge

Interdisciplinary knowledge consists of knowledge borrowed from other sciences other than nursing science. It refers to knowledge between different disciplines or domains. Bracken and Oughton (2009: 371-373) asserts that interdisciplinary knowledge involves inquiries that critically draw upon two or more disciplines, and that lead to an integration of disciplinary insights. This knowledge is transferable between disciplines or domains. In the context of the envisaged programme, interdisciplinary knowledge will be applied and integrated into the learners' conceptual knowledge as they explain the reasoning and thinking behind their facilitated critical thinking skills. Interdisciplinary knowledge will also assist the learners to analyse, interpret, draw inferences, evaluate, and self-regulate as they give explanations of their thinking, and that of their fellow learners.

The learners will also make interdisciplinary connections by using other related knowledge from subjects like anatomy, physiology, microbiology, pharmacology, psychology, sociology, chemistry, and physics to enhance the process of data interpretation. Interpretation involves the process of categorisation, decoding significance, and clarifying meaning (Facione, 1990:6 – 7).

According to Askland (2013: 244-267) the use of interdisciplinary knowledge allows the learners to understand their preconceptions of “what is”, and the framework by which they arrive at conclusions. It allows for an environment where the learners bring pre-existing ideas with them to the learning process. Interdisciplinary knowledge will assist the learners to overcome a tendency to maintain preconceived notions.

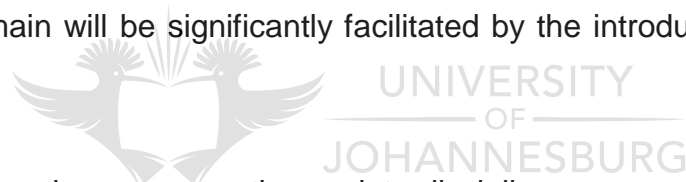
This will be accomplished by recognising the source of the pre-existing understandings they arrive with, and by introducing the learners to subject matter from a variety of perspectives that challenge their existing notions. Interdisciplinary knowledge will firstly help the learners to identify insights from a range of disciplines that contribute to an understanding of the issue under consideration. According to Negev and Teschner (2013:50-59) interdisciplinary knowledge is characterised by the integration of knowledge across a central programme theme or focus. Negev and Teschner (2013: 50-59) further argue that interdisciplinary approaches, while arguably less effective than traditional approaches for building the depth of single-subject knowledge, emphasise higher-order thinking, such as analysing, applying, generalising, and seek meaningful connections between and among disciplines.

According to Wesselink (2009: 404-413), with repeated exposure to interdisciplinary thought, the learners will develop more advanced epistemological beliefs, enhanced critical thinking ability, meta-cognitive skills, and an understanding of the relationships between perspectives derived from different disciplines, using the interdisciplinary learning approaches. Interdisciplinary knowledge will facilitate shifting the programmatic focus from memorisation of facts to focus on a central theme, application of knowledge relative to the theme, and reflection on facilitating the learners’ critical thinking skills. The learner will use their facilitated critical thinking skills to attain higher level beliefs about the source, certainty, and organisation of knowledge (epistemological beliefs), and will be better prepared to contend with complex knowledge domains that lack structure.

In turn, development of higher level epistemological beliefs will lead them to a more personal construction of knowledge, emphasis on coping with difficult tasks, the search for multiple solutions, focus on the evolving connections among ideas, and interpretation and application of knowledge across several contexts (Wesselink, 2009: 404-413).

According to Gouvea, Sawtelle, Geller and Turpen (2013: 187-205), facilitation of the learners' critical thinking skills will be promoted when curricula balance a focus on the critical thinking skills with a focus on learning specific content while using interdisciplinary knowledge. The value of using the interdisciplinary knowledge approach leads to complex, internalised organisation of knowledge.

This organisation of information is referred to as a "knowledge structure", which is an internalised framework of all the related perspectives, concepts, ideas, and methods of inquiry making up the knowledge domain and giving it meaning. Knowledge structures are known as "schemas," "mental models," or "conceptual frameworks," (Gouven et al, 2013: 187-205). While knowledge structures are not exclusively interdisciplinary phenomena, the capacity of the learner to create meaningful connections across the knowledge domain will be significantly facilitated by the introduction of interdisciplinary perspectives.



By focusing on an issue or core theme, interdisciplinary approaches will encourage the learners whose critical thinking is facilitated to perceive the connections between seemingly unrelated domains, thereby facilitating a personalised process of organising knowledge. As the learners assimilate newly integrated concepts with prior knowledge and experience, they will increasingly create complex connections between declarative facts that may ultimately predict the retrievability of knowledge (Stein, Connell & Gardner, 2008: 401-414). According to Lattuca (2010: 2) interdisciplinary competence is highly dependent on building connections between theories, approaches, and methods of inquiry, concepts, and paradigms, i.e., interpretive tools through which the learners derive a frame of reference for exploration of a theme. The use of interdisciplinary knowledge facilitates higher-order cognitive processing by motivating the learners to engage in deep learning. When the learners take a deep approach to learning, through their facilitated critical thinking skills they will seek meaning, reflect on what has been learned, and internalise knowledge by creating personal understanding.

Deep learning is often contrasted with surface learning (e.g., memorisation of facts) and characterised by important and long-standing changes in intellectual development. The learners will use their facilitated critical thinking skills to weigh evidence, determine the validity of data-based generalisations or conclusions, and distinguish between weak and strong arguments. If the learners are adept at thinking critically, they will be adept at gathering, analysing, synthesising, and assessing information, as well as identifying misinformation, prejudice, and one-sided monological argumentation.

According to Boix Mansilla and Duraisingh (2007: 215-237) the use of interdisciplinary knowledge involves a process of synthesis or balance of multiple perspectives from multiple disciplines to produce a deeper understanding, a balanced judgment, viable solution, or a product that creatively accommodates the different perspectives. This process is called developing an interdisciplinary understanding. Interdisciplinary understanding is said to be the capacity to integrate knowledge and modes of thinking in two or more disciplines or established areas of expertise to produce a cognitive advancement, such as explaining a phenomenon, solving a problem, or creating a product in ways that would have been impossible or unlikely through single disciplinary means.



Interdisciplinary knowledge assists the learner to develop an appreciation of the differences between disciplines and how to approach a problem and their discipline-specific rules regarding viable evidence. This will lead to a broader understanding of the issue under investigation. Interdisciplinary instruction fosters acquisition of foundational knowledge, promotes integration of ideas from multiple disciplines, and provides insight on how to apply knowledge – all of which advance the learner’s understanding of how to learn using their facilitated critical thinking skills.

According to Spelt, Biemans, Tobi, Luning and Mulder (2009: 365-378), interdisciplinary knowledge helps the learner to address complex issues, as it is believed that a cross-disciplinary approach facilitates a comprehensive understanding of the content. The learner will use their facilitated critical thinking skills to synthesise knowledge of different disciplines, and to cope with complexity using their facilitated critical thinking skills.

The learner will draw from their interdisciplinary knowledge, for example, they may draw from their knowledge of psychology and sociology and integrate this knowledge with their knowledge of nursing care to make sense of a patient's condition, and how to care for them holistically. The learner will use their facilitated critical thinking skills to change disciplinary perspectives and create new meaningful connections across disciplines. They will use their interdisciplinary, conceptual and procedural knowledge that is required for enabling them to take cognitive steps beyond disciplinary theories and methods in order to make connections between disciplines, to identify disciplinary contradictions, and to consider opportunities for integration at a higher level of thinking.

According to Lee and Ou Liu (2010: 665-688) for knowledge integration to take place during the use of interdisciplinary knowledge, the learner will develop a range of ideas, adding new ideas from content, experience or interaction with others, sort out ideas from various levels of analysis, develop more nuances and criteria for evaluating ideas, and develop progressively related sets of views about phenomena. The learner will use evidence to sort out, compare, analyse, and critique the varied ideas they hold and encounter in facilitating their critical thinking skills. Learners will conceptualise the knowledge they have at hand. They will start with a broad range of ideas about a phenomenon, while at the same time promoting normative ideas and adopting abstract ideas about the particular phenomenon under consideration.

Wang, Huay and Zhao (2009: 95-104) posits that during knowledge construction new associations are formed and old ones are modified within the learner's knowledge networks or structures. These links connect the new ideas from other disciplines together, and integrate them into the learner's existing cognitive representation of the world. Adding more and better links results in a more elaborate and richly integrated cognitive structure that facilitates memory, and recall of complex knowledge construction is indicated by the critical thinking skills of explanations, inferences, justifications, hypotheses and speculation. It is therefore important that the educator guides the learners towards integration of knowledge drawn from other disciplines into their existing conceptual frameworks using their facilitated critical thinking skills.

Learners enter the learning environment with a wealth of knowledge from personal experience and prior learning. However, to have their critical thinking skills facilitated in a meaningful manner that will make personal sense, the learner should possess a disposition to want their critical thinking facilitated. According to Quinn and Hughes (2013: 77) the content must have a logical meaning and be related to the learner's cognitive structure in a sensible way. The learner's cognitive structure provides an anchor for integration of knowledge from other disciplines, which may be modified through the process of assimilation. The learner's cognitive structure must contain relevant ideas with which the knowledge drawn from other disciplines can be integrated.

Ausubel's assimilation theory (1978: 251-257) states that meaningful cognitive learning will occur as a result of integration of interdisciplinary knowledge that the learner acquires into the relevant cognitive structure they already have. The learner's cognitive structure, which consists of schematic networks, is made up of thousands of interconnected bits of information that serve as a framework of knowledge. The schematic structure is dependent on the manner in which the learner initially processed the information presented to them. Ausubel (1978: 251-257) refers to these associations as "cognitive hooks". Instruction that provides the learners with links to connect otherwise discrete bits of knowledge enhances their ability to recognise and apply prior knowledge to new related learning, while integrating interdisciplinary knowledge.

According to Stein, Connell and Gardiner (2008: 401-414), the learner whose critical thinking skills are facilitated will integrate interdisciplinary knowledge through the process of synthesis, whereby they will take information from different disciplines and mentally put it together in ways that make sense to them and others. During the process of integrating this knowledge, the learner incorporates the newly acquired information into their existing knowledge structure using interdisciplinary knowledge. This process involves determining how the existing knowledge is related and how it should be modified to accommodate the new information, and how the new information should be modified in relation to the existing information.

On the other hand, Thomas (2013: 243-267) asserts that knowledge integration is an infusion of methods and knowledge from one discipline into the other, rather than infusion of content. It involves the abstraction of ideas from one situation and applying it to another across disciplines. Interdisciplinary knowledge enables the learner, whose critical thinking skills are facilitated, to develop tolerance for ambiguity or self-contradiction. The learner will develop sensitivity to ethical dimensions of issues, the ability to synthesise and integrate information, to have an enlarged perspective, creativity, original insight into issues, critical thinking, and a balance between subjectivity and objectivity. Through knowledge integration the learner will advance their comprehensive descriptions, multi-causal explanations, interpretations, or deeper explorations that benefit them from the integration of interdisciplinary perspectives (Rhoten, Boix Mansilla, Chun & Thompson Klein, 2006: 1-30).

Lin, Huang and Yang (2011: 1-5) assert that during knowledge integration the learner retrieves, reflects, evaluates, and merges ideas about observed phenomena using interdisciplinary knowledge. The process involves connecting their existing knowledge to newly organised knowledge drawn from other disciplines. The integration process engages the learner in a mental activity of monitoring, actively reflecting, evaluating, and modifying their own knowledge. It is a process of adding, distinguishing, organising, and evaluating accounts of phenomena, situations, and abstractions. Integration includes expanding the learner's range of ideas, distinguishing between ideas, making links between them, and identifying weaknesses in their current knowledge.

On the other hand, Godemann (2008: 625-641) asserts that through the use of interdisciplinary knowledge and integration thereof into their prior knowledge. The implication is that the learner will ask meaningful questions about complex issues and problems, locate multiple sources of knowledge, information and perspective, compare and contrast knowledge to reveal patterns and connections, create an integrated framework and develop a more holistic understanding.

According to Thomas (2013: 243-267), knowledge integration is a coherent combination of different sources, and types and levels of information. Integration is needed in the learning environment during the facilitations of the learners' critical thinking when they have interdisciplinary knowledge or representation of different types of knowledge. Formalised knowledge from different sources, which may be simulations, experiments, observations, or subjective judgment and from varying levels. The purpose of integration of knowledge is often to improve decision-making. The reason that knowledge from different disciplines is being collected and synthesised is to provide some coherent input to a decision. Therefore knowledge integration builds on cognitive processes of interpretation and representation. Integration of interdisciplinary knowledge involves methods for ensuring that the facilitated critical thinking skills used for integration is "owned" by the learner and becomes part of their problem-solving and /or decision-making activities.

According to Borrego, Newswander, McNair, McGinnis & Paretto (2009: 1-26), the value of using interdisciplinary knowledge and integration will increase cognitive dissonance of the learner whose critical thinking is facilitated, give relevance to prior knowledge, and extend value and their self-confidence beyond discipline knowledge. They will also transfer learning and cognitive skills to other situations while prior knowledge and experience is recognised and validated.

c) Foundational knowledge

The educators cited the importance of foundational knowledge in facilitating the learners' critical thinking, as it forms a basis on which they can build more advanced knowledge. They said "*it is important that learners have the groundwork in place which was referred to as foundational knowledge*". Foundational knowledge forms the basis on which facilitating the learners' critical thinking skills should be based. For example, for the learners to understand the patho-physiology of a respiratory condition, they have to understand the normal physiology of respiration. This knowledge is used as a frame of reference to build on and construct new knowledge. Without foundational knowledge, the learner whose critical thinking is facilitated will not have the conceptual knowledge schema to draw from and use to comprehend the new content.

According to Gallagher, Kaiser, Simon, Beath and Goles (2010: 144-148), foundational knowledge includes knowledge and the understanding of basic facts, ideas, and perspectives. Foundational knowledge also includes an understanding that the conceptual structure of factual knowledge within a subject is essential when applying factual knowledge in other areas. It is also essential for other kinds of learning to be useful, hence the term 'foundational'. In addition to being able to recall information and ideas, the learner also needs to be able to apply their knowledge or skills to new situations. This category includes learning to engage in critical thinking. Practical learning occurs when foundational knowledge is applied to answering questions, solving problems, or making decisions. This comes from integration, which involves being able to make connections between specific ideas.

Gillespie and Paterson (2009: 164-170) define foundational knowledge as those concepts or bodies of knowledge that shape and constrain other conceptual understandings. They propose that in contrast to earlier research on knowledge, such as Piaget's major studies of a person's concepts, which emphasised domain-general structures and processes, recent research has focused on the knowledge itself, as the content on which the mind works. According to Weber (2011: 3-15), in the context of a discipline, the foundations of the discipline, which includes foundational knowledge, should enable both academics and practitioners within the discipline to undertake their work, with the confidence that the knowledge they have, has a solid base. The foundations provide a core set of knowledge that allows the learner whose critical thinking is facilitated to identify problems that are important to the discipline, and to develop solutions to these problems. The foundations also allow practitioners to resolve the day-to-day problems they confront in practice in a coherent and meaningful way.

As new phenomena within a discipline emerge (for an example, new technology is deployed), foundational knowledge provides the basis for prediction and explanation within the discipline. This type of knowledge is also substantive and is based on sound, innovative, insightful, painstaking research, and is coherent. It is not piecemeal, instead, it is integrated and cumulative. One piece is built on another. Its underlying structure will be evident to the competent members of the discipline.

In applied disciplines, the members of the discipline must be familiar with foundational knowledge from a range of related disciplines if they are to solve the problems they confront in an effective and efficient way. Being an adept practitioner in an applied discipline requires breadth and depth of knowledge in many areas on the part of the learner. This implies that the learner need to use their facilitated critical thinking skills to acquire knowledge across disciplines in order to become competent practitioners.

On the other hand, Rittle-Johnson and Star (2009: 529) suggests that the conceptual knowledge (factual information) and procedural knowledge (process-based information), forms the foundation for the acquisition of foundational knowledge. For example, the learner who analyses relationships between a respiratory condition and cardiac output and those defined as “other”, will need conceptual knowledge of the respiratory and circulatory systems and mechanisms within the two systems to understand their points of convergence or divergence, but they will rely on procedural knowledge of various disciplines to promote critical probing, for example, physiology, physics, and so on. The foundational knowledge essential to integrate units will promote the learners’ ability to critically assess the relationships among multidisciplinary perspectives and evoke a deeper cognitive analysis of the core theme of the content. Therefore foundational knowledge forms a frame of reference and basis on which thinking is built.

Kuper and D’Eon (2011: 36-43) suggest the use of foundational knowledge of the discipline in practice with application of critical thinking skills. This is a valid argument to a point, but the question may be how much foundational knowledge is enough? Is it necessary (or even possible) for learners to have all of the foundational knowledge associated with a discipline before they can tackle any problem? More provocatively, what do we mean by “foundational knowledge”? Typically, when educators point to a need for the learners to have a foundational knowledge, they really are advocating that learners memorise information as a precursor to applying the information through problem-solving. Rarely, though, does memorising a database of knowledge assist the learners in solving problems (Kuper & D’eon, 2011: 36-43).

According to Fricke (2009: 131-142), foundational knowledge has to do with propositional knowledge and beliefs concerning the meaning and descriptions of relevant concepts and the relationships between them. In the context of the envisaged programme, foundational knowledge will include multiple factors that have been identified as being significant to the teaching and learning of critical thinking, the ontological status of critical thinking, and the purpose of teaching it. According to Rao, Gunjan Mansigh and Osei-Bryson (2012: 577-589), ontology refers to knowledge representation infrastructure created for the provision of shared semantics. Ontologies are complex knowledge representation artefacts intended for the development of intelligent application on the one hand, and are social constructions intended for communication and crystallisation of domain-specific knowledge on the other.

They can provide semantics through relationships between concepts and model presentation for hierarchy and semantic meaning of concepts. It will include contributory codes, awareness of purpose, identifying errors, overt subject knowledge, theoretical underpinning of learning and reliance on procedure. Furthermore, Drake (2009: 1-12) assert that foundational knowledge will encourage the learner whose critical thinking is facilitated to explore the historical context of contemporary educational experiences, and to promote the fundamental principles of learning. Therefore, it is important that the learners have foundational knowledge to facilitate critical thinking that will form a base on which they will build the conceptual, procedural, and interdisciplinary knowledge.

d) Procedural knowledge

The participants cited procedural knowledge as another aspect that is important in facilitating critical thinking. Procedural knowledge involves the “how” of doing things, and this knowledge is used in processes and procedures. Procedural knowledge involves knowledge, enabling skills, affective/behavioural processes, and operations (Shen & Wyer, 2008: 727-737). Enabling skills include observing, comparing/contrasting, grouping/labelling, categorising/classifying, ordering, patterning, and prioritising. Processes include skills related to analysing questions, facts/opinion, relevancy of information, and reliability of information. Processes also include skills necessary for inferring, understanding meanings, cause/effect, making predictions, analysing assumptions, and identifying points of view.

Operations include logical reasoning, creative thinking, and problem-solving skills (Costa, 2008: 54). On the other hand, if the focus is on procedural knowledge, it is likely that modelling would be the more appropriate teaching method. Likewise, if the educator is trying to impact the memory of images or visualisations, then modelling, active visualisations, or working with pictures might be more appropriate.

According to Pezzulo (2011: 78-114), procedural knowledge is exercised in the performance of a task. Procedural knowledge refers to the skill of knowing how to do something. It implies having the knowledge to accomplish a task. Involved in is knowledge of formal language or symbolic representations, and knowledge of rules and procedures. It is knowledge that is usually encoded in conceptual knowledge first, and then translated into a procedure, but it can also be learned by feel or intuition.

It consists of procedures that specify the action to be taken if a particular condition is to be satisfied. According to Harvey and Anderson (2008: 1-21), it is associated with automatic behaviours and can be very specific. It can also be associated with concrete motor behaviour, or can be more abstract and associated with higher cognitive behaviour. Procedural knowledge will assist the learner to explain what thinking strategies they are using to get to a particular conclusion or outcome. It is reflected in motor or manual skill, and in cognitive or mental skill. In the context of this programme, it will manifest itself in the facilitated critical thinking skills the learners will use in the clinical learning environment.

Therefore, in the context of the envisaged programme the learner will apply the procedural knowledge of the facilitated core critical thinking skills and the related sub-skills in the learning process. For example, a learner whose critical thinking skills are facilitated should be able to retrieve and apply their procedural knowledge to assess the patient both subjectively and objectively using the conceptual knowledge they have, to explain and give meaning by assigning concepts related to the problem at hand. To have clinical competence, the learner needs foundational, practical, and reflective skills. Practical competency will require behavioural and psychomotor skills demonstrated by good manual dexterity competence. Salim, Puteh and Daud (2011: 231-240) assert that the psychomotor domain focuses on manual tasks and physical skills that require the manipulation of objects.

The domain also describes the coordination between the brain and the body in performing the task. Competency in psychomotor skills is developed through the following steps: imitation, manipulation, precision, articulation, and naturalisation. Psychomotor skills also involve the use of behavioural or affective and cognitive skills.

The learner will display a willingness to receive information that will enhance their procedural knowledge and will then respond by showing a change in behaviour as a result of the experience they have been exposed to while finding value in the new learning. The newly acquired information will be organised and internalised into their procedural schema for use when the need arises. The process of the development of psychomotor skills are described below.

➤ *Imitation*

Imitation refers to copying or mimicking the action of another. In this instance, the learner watches the educator doing something, for example, bathing a patient, and then repeats the procedure. According to Billings and Halstead (2012: 150-151), the learner whose critical thinking skills are facilitated will observe the educator or a more able peer applying their psychomotor skills and procedural knowledge to a particular situation or procedure. Having observed, they will repeat what they have observed. The educator also needs to provide the learner with the opportunity to imitate. The educator and the learner will use explanation, demonstration, and guided practice as they apply their procedural knowledge. According to Hecimovich and Volet (2011: 177-197), guided practice refers to the educator supporting the learner by suggesting strategies to learn critical thinking skills, and helping them with the use of those strategies.

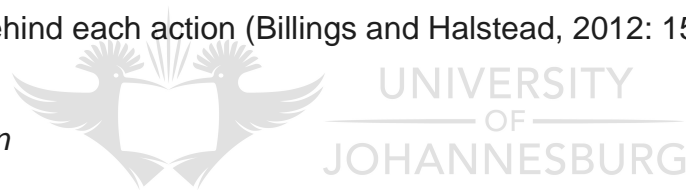
In addition, Thyer (2013: 79-87) suggests that guided practice involves identifying critical thinking skills demonstrated by the educator to the learners. This may range from the educator responding to the learner's critical thinking skills needs, to that of the educator being an initiator of ideas to facilitate the learners' critical thinking skills. The important aspect here is the responsibility the educator assumes to facilitate the learners' critical thinking. An initiator is the critically thinking educator who initiates relevant strategies and offers unsolicited suggestions and support to the learner in order to facilitate their critical thinking.

On the other hand, Grantcharov and Reznick (2008: 1129-1131) posits that the learner will copy or mimic the educator in an attempt to learn a complex skill after they have indicated a readiness to take the particular action. This includes a skill or act that has been demonstrated or explained, and it involves the learner being engaged in trial and error until an appropriate response is achieved.

➤ *Manipulation*

Manipulation refers to the reproduction of an action or procedure from instruction or memory. According to Grantcharov and Reznick (2008: 1129-1131), the learner whose critical thinking is facilitated will use their procedural knowledge and psychomotor skills to carry out a task from a written or verbal instruction. While using their facilitated critical thinking skills, the learner will continue to practise the particular skill or sequence until it becomes habitual and they can perform the action with some confidence or proficiency. The learner may break the actions into a step-by-step procedure and manipulate their facilitated critical skills to draw from their procedural knowledge to explain each step and the rationale behind each action (Billings and Halstead, 2012: 150-151).

➤ *Precision*



Precision has to do with accuracy, correctness, and meticulousness. Billings and Halstead, 2012: 150-151) posits that precision will come about when the learner in the envisaged programme is given time to practise a skill until they are able to perform it without error. In this step the learner is able to perform the skill however they still need support from the educator or a more able peer. The learner will indicate proficiency by a smooth and accurate performance requiring minimum energy. The overt response is complex and performed without hesitation (Grantcharov & Reznick, 2008: 1129-1131).

➤ *Articulation*

According to Grantcharov and Reznick (2008: 1129-1131), during articulation the learner in the envisaged programme will adapt and integrate their critical thinking skills. They will relate and combine associated activities to develop methods to meet varying novel requirements. The skills will be so well developed that the individual can modify movement patterns to fit special requirements or to meet a problem situation.

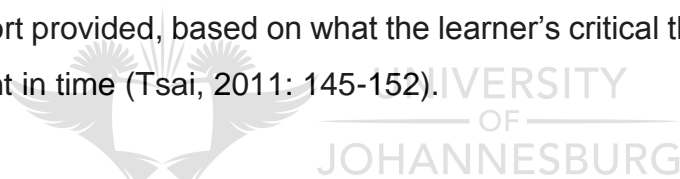
➤ *Naturalisation*

In this step the learner completes one or more skills with ease using their facilitated critical thinking skills and the procedure or behaviour becomes automatic. Billings and Halstead (2012: 150-151) argues that at this stage the learner will display automated unconscious mastery of an activity at strategic level which exhibits the use of critical thinking. The learner will use their procedural knowledge to create their own actions or modify the learned psychomotor skills and move from being a novice to being an expert. It involves an even higher level of precision. While conceptual knowledge can lead to enrichment of the procedural knowledge, the learners also understand the concepts better, and the retrieval of the information is also enhanced. In the process of retrieval of the information, the improvement of procedural knowledge may also influence conceptual knowledge by enabling the learners to identify their misconceptions. They will also reflect and explain the conceptual basis for the procedures they are performing through the use of their facilitated critical thinking skills.

On the other hand, Reigeluth and Carr-Chellman (2009: 200-223) assert that firstly, the learner whose critical thinking skills are facilitated will acquire knowledge of what should be done, to what purpose, in sequence, and by what means. In this instance the learner requires the minimum knowledge necessary to start performing the task meaningfully, for example if the learner is going to administer oxygen to a patient then they have to have knowledge of the mechanism of respiration and indications for oxygen therapy. Following the initial step the learner will consciously apply their knowledge to execute the operation.

They will control the “what” and “how” aspects of the task, while applying their facilitated critical thinking skills. They will also use the perceptual information necessary to initiate and control action. The “when to do” and “how well done” aspects are almost visual and sometimes auditory.

Reigeluth et al (2009: 200-223) further posit that in the third stage the learner transfers control from the eyes to the other senses. When the learner gets to automatisation they reduce all conscious attention and thinking through of the action. Performance becomes a set of reflex actions, one triggering the next without direct conscious effort of the learner. The learner may execute the task and at the same time be thinking or talking about other matters in the learning environment. Lastly, the learner will generalise the skill to a continually greater range of application situations. In this domain the learner’s psychomotor skills are scaffolded from simple tasks such as bathing and feeding a patient, to more complex one’s like suturing a wound. It is a learner-centred strategy whose success is dependent on its adaptability to the learner’s needs. This means that in scaffolding the learner’s critical thinking in this domain the educator should be able to adapt the support provided, based on what the learner’s critical thinking skill needs are at a particular point in time (Tsai, 2011: 145-152).



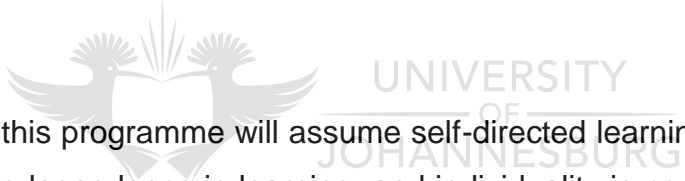
4.2.4.2 Methodological dimension

Methodological aspects to facilitate critical thinking answer the question of how to facilitating such thinking. The methods used to facilitate critical thinking as cited from the empirical findings are problem-solving and clinical decision-making enhanced through the process of reflection, Socratic questioning method, reasoning, argument, and collaborative and cooperative learning methodologies. The educator needs to be well-versed with these methodologies and be able to apply them in facilitating critical thinking.

According to Mouton (2009: 35) methodological considerations refer to the “knowledge of how” or “know how” to do things, or the total set of means the critical thinker employs to consider arguments or solve problems. It involves description of methods used to address the problem at hand. In the context of this programme it also includes the methodologies that the educator will employ to facilitate the learners’ critical thinking skills. The methods include skills, cognitive operations, and knowledge of how to facilitate critical thinking.

The learners' facilitated critical thinking is also regarded as intellectually engaged, skilful, and responsible thinking that facilitates their good judgment, because it requires them to apply assumptions, knowledge, competence, and the ability to challenge their own thinking. Thinking critically implies the learners' knowledge base from which they reason using that knowledge and their ability to analyse and evaluate evidence. Knowledge can be manifested by the logic and rational implication of their decision-making. They will be able to critique relevant interventions, weigh consequences of various decisions possible, and consider multiple perspectives to solve problems, as well as evaluating the thinking skills that informed such decisions.

Metacognition is important to learning in all disciplines. However, the understanding of what one is doing in applying techniques and principles that inform such techniques is just as important. Methods to facilitate critical thinking are based on procedural knowledge, which includes cognitive and behavioural processes. The learners will use this kind of knowledge to make connections, build schemata, and develop new concepts from their previous understanding of the patient's health problems (Cheng, 2009: 471-494).



The learners in this programme will assume self-directed learning with the emphasis on active enquiry, independence in learning, and individuality in constructing meaning. The learners should actively engage with knowledge as they draw on their previous experiences to construct knowledge. The educator is required to serve as one of many resources of information for the learners. They need to use teaching strategies that engage the learners in experiences that challenge the previous concepts of their existing knowledge. The educator should encourage questioning and discussion in the classroom, and the learners should be assisted to understand their critical thinking skills as these get facilitated. A further implication is that the educator should encourage learner autonomy and initiative by demonstrating a willingness to allow co-sharing and co-responsibility of the learning environment.

According to Abrami, Bernard, Borokhovski, Surkes, Tamim and Zhang, (2008: 1102-1134) the critical thinker uses methods to explain the “why”, “how” and “what”. They use their understanding of conceptual considerations to explain the reasoning behind the methods they have employed.

These considerations are drawn from pre-formulated schemas of conceptual knowledge in the learner's mind which are consulted and which through the application of their procedural knowledge, provide an explanation for their reasoning. Benner, Hughes and Stuphen (2008: 1-23) are of the opinion that the learner whose critical thinking is facilitated should have a conceptual base from which they analyse, evaluate, interpret, and infer ideas as they provide explanations of the reasoning for their actions. The methodologies used in critical thinking involve cognitive processes of reflection, Socratic method of questioning, reasoning strategies such as deductive reasoning, inductive reasoning, hypothetico-reasoning and dialectical dialogic reasoning, argument and cooperative/collaborative interaction that are used to facilitate such thinking as described hereunder.

a) Reflection

According to Mann, Gordon and MacLeod (2009: 595-621), the learner whose critical thinking is facilitated will use reflection and reasoned thinking for problems that have more than one solution and that is focused on decisions about what to believe and do in the situation at hand. This means that their facilitated critical thinking will enable the learners to arrive at a sound and rational decision to implement in practice. In reflection the learner considers evidence, the context of judgment, the relevant criteria for making the judgment well, the applicable methods or techniques for forming judgment, and the applicable theoretical constructs for understanding the problem and question at hand. To solve problems using critical thinking the learner should use reflection to get to decision-making.

The implication for the educator is that they should design learning experiences that are interactive, where the learners are "doing", reflecting on, and evaluating their learning experiences and build on previous learning experiences to construct new knowledge and meaning through the use of their critical thinking skills (Cress & Kimmerle, 2008: 105-122).

According to Pisapia, Sun-Keung Pang, Fatt Hee, Lin and Morris (2008: 1-27), reflection is a cognitive skill that involves careful consideration of any belief or practice that promotes understanding of situations and the application of the newly gained knowledge to these situations.

The process of reflection involves the learner undertaking a cognitive process of subjecting evidence, perceptions, and experience to critical scrutiny, but suspending critical judgment, in order to make sense and meaning of situations prior to weaving their thinking into a theory of practice. By reflecting on experiences, the learner whose critical thinking is facilitated will unpack the assumptions and values that lie beneath rules, regulations, and skills in work and everyday life. This constant effort of re-evaluation and interpretation is an integral part of how they will make sense of situations. Even though the learner is without all the information needed, the use of reflection will offer the best possible option for action and prediction (Cress et al. 2008: 105-122).

According to Brandt (2008: 37-46) reflection is a means to develop critical thinking. Reflection allows the learner to make judgment in complex and ambiguous practice instances. The educator should encourage the learners to reflect-on-action, which signifies thinking through a situation after it has occurred. During the reflection the learner will re-evaluate the experience and decide what to do differently the next time they encounter a similar situation. On the other hand, reflection-in-action outlines what the learner is doing while they are doing it. It calls on the formation of new ways of thinking and acting about problems in practice.

This mental activity will drive improvement and is mindful and purpose-driven. Critical thinking involves reflection, especially in areas of self-monitoring, self-evaluation, and self-reinforcing of goal-directed behaviour and reflective practice. It takes critical thinking to a different level.

Therefore, the educator should encourage the use of reflection to facilitate the learners' critical thinking skills (Purvis, 2009: 5-7). According to Yanow and Tsoukas (2009: 1339-1364) reflection-in-action refers to an instance whereby the learner becomes a researcher in the learning area. The learner is not dependent on the categories of established theory and technique, but constructs a new theory.

The learner enters into a dialogue with self, formulates theories, tests hypotheses, and adjusts their practice accordingly. Through reflection-in-action learners are enabled to understand the principles and processes that underpin their actions, and to offer justification for their practice in a more articulate manner than usual.

According to Phan (2010: 284-292) reflective thinking focuses on the process of making judgments about what has happened. However, reflective thinking is most important in prompting learning during complex problem-solving situations because it provides the learner with an opportunity to step back and think about how they actually solve problems, and how a particular set of problem-solving strategies is appropriate for achieving their goal. To provide a learning area that is supportive of reflective thinking, the educator needs to provide enough wait-time and space for students to reflect when responding to inquiries, and an emotionally supportive learning environment that encourages re-evaluation of conclusions.

The educator needs to prompt reviews of the learning situation, what is known, what is not yet known, and what has been learned. The educator should give the learners authentic tasks that involve ill-structured data to encourage reflective thinking during learning and teaching activities.

Phan (2010: 284-292) further argues that the learners' reflection should be enhanced by asking questions that seek reasons and evidence, and by providing some explanations to guide the learners' thought processes during explorations. The educator should create a less-structured learning environment that prompts the learner to explore what they think is important. The learning area should subscribe to a social-learning environment that is inherent in peer-group works and small group activities to allow the learners to see other points of view.

The learners may keep reflective journals to write down their positions, give reasons to support what they think, show awareness of opposing positions and the weaknesses of their own positions. To engage in critical reflection and thinking requires the learners to have an inclination to listen, to tolerate diversity, disagreement and uncertainty, the ability to engage in collaborative dialogue, to have divergent thinking enhanced and be open to new ideas.

According to Lasater and Nielsen (2009: 40-44) the learner will follow the steps in journaling, namely critical appraisal, peer group discussion, and self-awareness. During critical appraisal the learner analyses important clinical events. They freely include descriptions, emotions, reactions, and cathartic reflections of their experiences.

Following this they will engage in peer group discussion, which involves a discussion of the scope as well as practical and realistic aspects of clinical events. The learner shares questions originating from self-reflection and other clinical experiences, during the post clinical conference. The learner is encouraged to express their concerns and they integrate the theoretical perspective when discussing issues emanating from the clinical situation. During this step the educator uses socialisation as a didactic principle.

Schaap, de Bruijn, van der Schaaf and Kirschner (2009: 481-494) assert that socialisation in the didactic situation is defined as the learner's adaptation to their physical, psychological, and social environment through interaction with fellow learners. By socialisation during the peer group discussion the learner gets to appreciate and respect the opinions of others, consult each other, and come to joint decision-making, learns to argue, debates a problem, and convinces others. The third step involves undertaking a process of self-awareness and self-evaluation to complete the reflective process. The learner will document the unique aspects of their own learning as an outcome of group discussion. Through this process the learner is enabled to take the initiative to engage in the dynamics of self-reflection, as well as acquire the skill of self-evaluation. The learner will also gain the skill of critical analysis of clinical events. The post-conference discussion provides an opportunity to obtain peer feedback.

According to Mayer (2010: 543-549) the learner constructs knowledge through integrating and contextually applying subjective and procedural knowledge. This growth towards constructing a more holistic knowledge base about themselves is fostered through reflection and dialogue. Reflection-on-action helps the learner to construct rational and affective knowledge. The learner needs a supportive learning environment to reflect on their facilitated critical thinking skills and to process newly acquired understanding with peers. Both the personal reflection on the part of the learner and the shared dialogue with peers enriches self-awareness. Reflection requires the learner to be honest and confrontational with self, so as to understand contradictions of what is and what is desirable.

Through reflection new insights are revealed to the learner. Reflection fosters intrapersonal knowledge. The reflective process takes place on three different levels. The first level is a descriptive level whereby the situation, techniques, skills, relationships, and feelings are described. The second level is an evaluative phase wherein the learner is challenged to examine relationships between self and practice, and contradictions between espoused theories learned and theories used in practice (Mayer, 2010: 543-549). The third level examines ethical influences in the actual experience, as well as proposed needed changes.

These levels often overlap in a reflective exercise and direct the learner to reflect on practice in order to increase self-awareness of strengths and limitations, to integrate theory to practice, and to employ different perspectives and create approaches to practice. As Smith (2011: 211-223) points out, “We become critically reflective by challenging the established definition of a problem being addressed, perhaps by finding a new metaphor that reorients problem-solving efforts in a more effective way”. In this study, reflection refers to the learner’s ability to use procedural knowledge of logical and rational thinking, together with experiential thinking, through perceptions, experience, and information to make judgments as to what has happened, and then creates intuitive principles that guide future actions.

According to Bruce et al. (2011: 98) experiential learning involves an experience that embraces knowledge, skills, and the standard that is expected to be attained. The learner will bring the experience into their consciousness. Reflection being the most important element of experiential learning, it can take the form of individual, group, verbal and written reflection and can use a structured or unstructured format. For learning to take place the learner needs to reflect upon the experience while it occurs and make relevant adjustments. The third element is action, which implies that in order for the learner to benefit from the experience and the reflection they must have an opportunity to practise, test, or experiment with the new concept. The learner will have to utilise the new knowledge and skills obtained. The fourth element is revisiting the experience, whereby the learner does so with new increased awareness of the original experience. They may also try out the gained knowledge in different situations.

Reflection is a means to develop critical thinking. The reflective process is used as a method to facilitate the learner's critical thinking skills. It involves a continuous effort to evaluate and interpret experiences and issues in a quest to make meaning. It allows the learner to make judgments in complex and ambiguous practice instances. Reflective thinking focuses on the process of making judgments about what has happened. Reflection provides the learner with an opportunity to step back and think about how they actually solve problems and how a particular set of problem-solving strategies is appropriated for achieving their goal. According to Chabeli's model (2001), the process of reflection consists of three phases, namely awareness and disequilibrium, an interactive constructing process, and consolidation for decision-making and problem-solving, and the use of reflection to facilitate critical thinking is described according to these phases in this programme (Chabeli, 2001: 84-91).

In reflection, the learner will use perceptions, experience, and information to make clinical judgments as to what has happened in the past and what is happening in the present to help guide their future actions. Perception refers to the occurrences or processes during which the learner gives structure and meaning to certain stimuli in the learning environment. Through perception, the learner will convert the details of the observed and perceived details into concrete facets of reality (van Woerkom, 2010: 339-356). This ability will assist the learner to understand the past, present, and perhaps the future, by recognising why certain choices worked and others did not. The learners would demonstrate a willingness to question their assumptions and test whether their behaviours actually result in desired outcomes. It will enable them to use perceptions, experiences, and knowledge to understand situations, how to think about them, and inform action.

Smith (2011: 211-223) is of the view that reflection is synonymous with higher-order mental processes. It is a generic term for those intellectual and affective activities in which the learner engages to explore their experiences in order to learn new understandings and appreciations. Reflection includes making inferences, generalisations, analogies, discriminations, and evaluations as well as feeling, remembering, and solving problems. During the reflective process the learner whose critical thinking is facilitated will assess the grounds for their justification, rationally examine the assumptions they have used to justify their convictions.

Through reflection the learner will pause and thoughtfully reassess issues. They will bracket their prior judgment, attempt to keep their biases in check, and through a critical review of the evidence and argument, make a determination about the justifiability of the expressed idea that is contested. Critical reflection refers to challenging the validity of presuppositions in prior learning. Through critical reflection the learner becomes critically aware of their own presupposition, which involves challenging their established and habitual pattern of expectation and the meaning perspectives with which they have made sense of their encounters with the learning environment.

According to Fook, Whites and Gardiner (2011: 1-18) reflection involves an active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusion to which it tends. Reflection includes the process of internally examining and exploring an issue of concern, triggered by an experience that creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective. Reflective practice or critical reflection involves a process (cognitive, emotional, and experiential) of examining assumptions embedded in action or experience, a linking of these assumptions with many different origins, a review and re-evaluation of these according to relevant assumption depending on context, purpose and a reworking of concepts and practice based on this re-evaluation.

On the other hand, Levett-Jones, Gersbach and Roche (2011: 64-69) assert that reflection is a key mechanism in the process of being critical and illuminates the why and the reason for what is done and how to critically discriminate what is relevant. Through reflection, what is sought within context are not only necessary facts, but also underlying assumptions.

Reflection requires dialogue, a reflective interactive conversation that is never an end in and of itself. It is rather an interactive process of evaluating perspective and assumptions within context, in order to achieve situational understanding. Through dialogue and reflection, time is also revealed. Operationalising time as a part of the critical thinking process involves recalling prior learning experiences and how these may affect the learner's interpretation and understanding of the context of the present situation, which will impact future action.

They further assert that reflection may include the use of narratives. Narrative pedagogy involves the learners and educator sharing and discussing their reflections on their practice and experiences using facilitated critical thinking skills.

According to Walsh (2011: 216-219) narrative pedagogy facilitates a critical dialogue that encourages the learners to challenge perceptions, to ask questions beyond expository or declarative knowledge, to make visible their critical thinking to broaden perspectives, and to reframe thoughts and insights. The learners and the educator publicly share their lived experiences. The learner uses narrative pedagogy to think about what is possible and problematic in the learning environment. The learners and educator are brought together into a converging conversation in which many perspectives are considered.

They interpret their experiences from various perspectives. The narrative pedagogy creates new possibilities for critical thinking. The learner persistently questions the meaning and significance of the learning experiences, and making visible that which had not been thought of before. On the other hand, Carroll (2010: 1-19) asserts that reflection is a meaning-making process that involves dialogic interaction between the learner and others. It is a process of reconstruction and reorganisation of experience, which adds to the meaning of experience. Reflection will move the learner from a disturbing state of perplexity (disequilibrium) to a harmonious state of equilibrium.

Perplexity is created when the learner encounters a situation whose entire character is not yet determined. This means that the meaning of the experience is not yet fully established. The yearning for balance will motivate the learner to initiate the process of reflection in their mind. Curiosity will motivate them further. Through reflection the learner facing the experience will spontaneously interpret the experience, name the problem or question that arises out of the experience, generate possible explanations, formulate an hypothesis out of explanations, and test the hypothesis.

Mehlhorn, Taatgen, Lebiere and Krems (2011: 1391) is of the opinion that hypotheses testing involves a process of diagnostic reasoning whereby the key elements include data acquisition, depending on the setting, and creating mental abstraction or problem representation. Characterisation of the problem facilitates the retrieval of pertinent information from memory.

The learner will come up with a number of possible hypotheses. Such reasoning may represent the mental processes of searching for and verifying an illness script with elimination of the hypotheses for which the defining feature of a specific illness script are absent. During the initial stages of reflection, interpretation is voluntary. Ideas leap to mind. From the “feeling” of the experience, possible meanings suggest themselves.

Thinking during this stage requires the learner to exercise discipline and patience. The learner will then name the problem or the question in a process called “intellectualisation”. This mental process is not casual, but is a disciplined process that demands that the learner continually grounds their critical thinking in evidence and does not overlook important information that may not fit their generated ideas.

This stage also demands that the learner align the information and questions they pose to evaluate whether the question is relevant to the information at hand. Formulation of questions depends on completeness and complexity of the data or description generated. Berland and Reiser (2009: 26-55) asserts that generating explanations involves forming tentative hypotheses, for example, a learner may conclude that a patient is presenting with shortness of breath due to lung infection as a tentative hypothesis pending the final diagnosis which could be the shortness of breath is due to congestive cardiac failure. It is the first phase of analysis. Explanations come from a synthesis of the meaning derived from the current experience with that drawn from previous experience. Other resources such as books and wide reading of current articles by experts will deepen and broaden the scope of the learner’s understanding. The learner will in their mind generate possible connections and meaning will take shape.

In the process they reconstruct and reorganise meaning and spend time analysing data of an experience so that it emerges in all its complexity. Reflective response is based on the full knowledge of its development. This stage provides the learner with a platform of reason and understanding from which they can take the next cognitive step. The action taken will be qualitatively different from routine action because of the reflective thought. Their response will be based on knowledge, self-awareness, subject matter, context, and the dynamic interaction among all these. Self-awareness is an important aspect of reflection, as it allows the learner to have insight into their strengths and weaknesses, and to know where improvement is needed.

It allows them to learn from experience, to have self-confidence, and to know how their feelings affect their performance. A self-aware learner acknowledges their emotions. They become objective about their abilities, and identify areas of improvement (Jooste, 2009: 245).

Sandars (2009: 685-695) is of the opinion that reflection involves a mental activity aimed at investigating one's own action in certain situations, and involving a review of experience, an analysis of cause and effect, and the drawing of conclusions concerning future action. The learner will use reflection to formulate a guiding idea for their action. The analysis and diagnosis of the situation leading to a working hypothesis is formed as a tentative guiding idea for action. Reflection involves a process of re-evaluation whereby the learner re-examines their experience in the light of new knowledge with that which they already possess, and integrates this into their conceptual framework.

It leads to an appropriation of this knowledge into the range of their behaviour and actions. This involves rehearsal in which new learning is applied mentally to test its authenticity, and the planning of subsequent activity in which this learning is applied in their practice. This then means that reflection is a dialogic process, where the learner considers the interaction of the internal mental and external environments and steers them to further thought and action. Reflection is seen as a kind of meta-thinking where the learner considers the relationship between their thoughts and understanding, and their actions in the learning environment (Sandars, 2009: 685-695).

A number of studies have looked at the types of teaching strategies that support the development of critical thinking. The practice arena is becoming more complex and intervention modalities become available and change more rapidly, prompting practitioners to constantly rethink, switch directions, and change problem-solving strategies. Thus, it is increasingly important to prompt reflective thinking during learning, to help the learners develop strategies to apply new knowledge to the complex situations in their day-to-day activities in the learning area.

Reflective thinking helps the learners to develop critical thinking skills by prompting learners to relate new knowledge to prior knowledge, to think in both abstract and conceptual terms, apply specific strategies in unfamiliar tasks, and to understand their own thinking and learning strategies. Reflection will allow the learner to make judgments in complex and ambiguous situations. This is described as the “integration of all learning in practice,” which suggests that, without reflection, the learners will be merely participating without meaningful facilitation of their critical thinking occurring (Sandars, 2009: 685-695).

As a result of reflecting on an experience, the process of “meaning-making” by the learner is an integral component of learning and facilitating their critical thinking. Reflective thinking requires both reflection-on-action and reflection-in-action. Reflection-on-action denotes thinking through a situation after it has happened, re-evaluating the experience, deciding what to do differently, and trying out the alternative approach. This reflection-on-action “drives improvement” and is “mindful”, purpose-driven, and honest openness to what the learner is doing. Reflection-in-action “reshapes what we are doing while we are doing it”, (Chabeli, 2001: 84-91)

This type of reflection requires the “creation of new ways of thinking and acting about problems of practice.” Therefore the educator needs to be cognisant that reflective practice is a result of a “cycle of action and reflection”; hence the learners need time for reflection in the learning process (Sandars, 2009: 685-695).

b) Socratic questioning/inquiry

According to Paul and Elder (2008: 34-35) the term ‘Socratic questioning’ is used to describe a kind of questioning in which an original question is responded to as though it were an answer. This in turn forces the first questioner to reformulate a new question in light of the progress of the discourse. The Socratic Method encourages the learners to reflect and think independently and critically. The Socratic dialogue is practised in small groups with the help of a facilitator, so that self-confidence in one’s own thinking is enhanced and the search for truth in answer to a particular question is undertaken in a common manner.

The method begins by calling on a learner at random, and asking them about a central argument put forth by one of the other learners. The questions can take several forms. Sometimes the educator seeks to challenge the assumptions upon which the learner based the previous answer until it can no longer be defended. Further questions can be designed to move a learner towards greater specificity in understanding a patient's health problem. The educator may attempt to propose a hypothetical situation in which the learner's assertion would seem to demand an exception. The educator can use the Socratic Method to allow the learners to come to decision-making on their own, through carefully-worded questions that encourage a particular train of thought.

Buraphadeja and Dawson (2008: 130-145) further asserts that the hallmark of Socratic questioning is that typically there is more than one "correct" answer, and more often, no clear answer at all. The primary goal of the Socratic Method in the learning area, is not to answer usually unanswerable questions, but to encourage the learner whose critical thinking is facilitated to explore the contours of often difficult issues, and to teach the learners the critical thinking skills they will need as practitioners. This is often done by altering the facts of a particular instance to tease out how the result might be different.

This method encourages the learners to go beyond memorising the facts of a case, and instead to focus on the application of problem-solving interventions to the facts relevant to the case at hand. The Socratic Method, if properly used, can show that decisions are usually conscientiously made, and are based on certain premises, beliefs and conclusions that are the subject of legitimate argument.

According to Knezic, Wubbels, Elbers and Hajer (2010: 1104-1111) the Socratic Method will involve the learner starting with the concrete and remaining in contact with concrete experience. Insight will be gained only when, in all phases of a Socratic dialogue, the link between any statement made and personal experience is explicit. This means that a Socratic dialogue is a process that concerns the whole person. Full understanding between learners involves much more than verbal agreement. Everyone has to be clear about the meaning of what has just been said by testing it against their own concrete experience. The limitations of the individual learner's personal experience that stands in the way of full understanding should be made conscious and thereby transcended. The learners should be encouraged to adhere to a subsidiary question until it is answered.

In order to achieve this, the learners are required to bring great commitment to their work, and to gain self-confidence in the power of reason. This means on the one hand, not giving up when the task is difficult, but on the other, to be calm enough to accept, for a time, a different course in the dialogue in order to return to the subsidiary question. Striving for consensus will require an honest examination of the thoughts of others, and the learner being honest in their own statements.

Knezic et al. (2010: 1104-1111) further argues that Socratic questioning is seen to be facilitative of critical thinking as it is defined as a type of questioning that deeply probes or explores the meaning, justification or logical strength of a claim, position or line of reasoning. Questions asked investigate assumptions, viewpoints, consequences, and evidence. The Socratic question method focuses on clarification. It is about moving the learner in a direction they want to go. It is not coercion or manipulation, but involves guiding, and when necessary, nudging the learner to examine the things that they take for granted, such as assumptions, beliefs, experiences, and paradigms. The Socratic methodology uses questions to challenge these assumptions, beliefs, experiences, and paradigms, and to check their accuracy and completeness.

The learners are guided on a journey of discovery and are moved towards greater understanding while their critical thinking skills are facilitated. Socratic questioning leads the learners to explore, challenge their thinking, and discover answers for themselves. For example, a learner's question can be followed by asking a fellow learner to summarise the previous answer.

According to Paul and Elder (2008: 34-35) and Brookfield (2011:92-96), Socratic questioning fosters critical thinking, evaluation, and knowledge application in learners. Generally Socratic questioning raises basic issues, probes beneath the surface of things, and pursues problematic areas of thought. The philosophical approach of content by the educator makes it easier for the learners to integrate their thinking across the content division. Questioning is a teaching technique through which firmly fixed assumptions can be externalised. It encourages the learner to become their own questioner and develop habits of critical reflection. It is designed to elicit the assumptions underlying the thoughts and action. It is not so much concerned with eliciting information as with prompting reflective analysis, which is one of the skills of critical thinking.

The educator needs to formulate insightful questions. They must be able to explore what are often highly personal matters, in a sensitive manner and ask questions that might usually be considered highly intimidating questions, in a non-intimidating manner.

Campbell and Mayer (2009: 747-759) posits that questioning should activate analysis, comparison, evaluation, and critical inquiry. “Why” questions, which require an explanation of principles, helps determine the amount, direction, and quality of the learners’ thinking. The questioning is such that it enables the learners to organise and interpret learning into generalisations through the use of critical thinking. The educator should formulate questions that facilitate an attitude of critical inquiry in the learners. Questioning is one of the most effective teaching strategies. The educator needs to assist the learners to form relationships, induce involvement, and enhance the learners’ self-esteem through questioning.

According to Dull and Murrow (2008: 391-412) during questioning the educator should not forget the learning outcomes to be achieved, as well as integration of the critical cross-fields outcomes, monitor the learners’ verbal and non-verbal responses, and maintain the flow and development of the lesson. Questioning can include co-operative questioning. Co-operative questioning incorporates critical thinking dispositions and skills. This is achieved through learner generated questions. The method empowers the learners as question generators. The questions can then be deliberated co-operatively within their co-operative learning teams, rather than individually in isolation.

Dull and Murrow (2008: 391-412) maintain that Socratic questioning is not about coercion or manipulation. The Socratic approach uses questions to challenge these to check for accuracy and completeness. It promotes synthesis of information into discernible categories of facts and opinion. It is aimed at raising basic issues, probing beneath the surface, and pursuing problematic areas of thought. Socratic questioning further helps the learner to discover the structure of their thought and to develop sensitivity to clarity, accuracy, and relevance. It also assists them to arrive at judgment based on their own reasoning, and to note claims, evidence, conclusions, interpretations, implications, concepts, and points of view that are considered to be elements of thought.

Through Socratic inquiry the learner learns to paraphrase, defer, and take turns, as well as to deal with frustration while they are awaiting their turn. They have their self-esteem built, feelings of self-worth are enhanced, and their ability to construct meaning independently is developed through the use of their facilitated critical thinking skills (AETC Trainer's Toolkit, 2008: 1-15).

Billings and Halstead (2012: 274-275) are of the opinion that Socratic questioning promotes active thinking about conclusions to be drawn, in that it increases the interaction between the learners and the educator. It further facilitates discussion from multiple perspectives while it allows the learners to discuss concepts from their own experiences and conception. During Socratic questioning the learner discloses their underlying assumptions and increase their articulation of evidence while they are stimulated to ask higher order questions.

Therefore, the implication is that the educator needs to take adequate time to construct thought-provoking questions and aim at facilitating a discussion that follows a good questioning exercise. Furthermore, facilitating the learners' critical thinking skills will be enhanced if a pre-class assignment that leads to adequate learner preparation is designed. The educator can use questioning spontaneously as an exploratory strategy, or with issue-specific content. An open, trusting classroom environment should be ensured, and the designed questions should assess various critical thinking skills and sub-skills.

In agreement, Hughes and Quinn (2013: 165) assert that the educator needs to respond to all the learners' answers with a further question that will call upon the learners to develop their thinking fully and deeply. They should seek to understand the ultimate foundations for what is said or believed, and guide the learners' critical thinking by following the implications of those foundations through further questions. Furthermore, the educator should treat all assertions as connection points for further thought, and as thoughts in need of development. The learners should be stimulated to go through questioning to pursue those connections, and maintain openness to presupposed questions by the learners.

Questioning has both cognitive and affective components. Successful questioners value objectivity and rationality to resolve problems. They respect evidence as the test for accuracy; they express willingness to suspend judgment, and are tolerant of ambiguity to a point. These are the characteristics this programme aims to facilitate as programme outcomes in the learners. Questioning is characterised by curiosity and respect for the use of reason (Rajput, 2009: 62-69).

In this strategy the educator has an obligation to guide the learners as they formulate ways to gather information/evidence to answer questions. Depending on the variances in degree of assistance, the learners determines what data might be relevant, decides how to gather it, represents the collected data, and organises it in a useful manner. Socratic questioning consists mainly of six types of questions as depicted in Table 4.3, as adapted from Paul and Elder (2008: 34-35).

TABLE 4.2 Socratic Questions as adapted from Paul and Elder (2008)

Type of Questions		
Question of Clarification	Questions that Probe Assumptions	Questions that Probe Reasons and Evidence
What do you mean.....?	What are you assuming?	What would be an example?
What is your main point...?	What is Nomsa assuming?	How do you know?
How does...relate to.....?	What could we assume instead?	Why do you think that is true?
Could put that in another way?	You seem to be assuming.....Do I understand you correctly?	Do you have any evidence for that?
Is your basic point....or....?	All of your reasoning depends on the idea that....Why have you based your reasoning on.....instead of.....?	What difference does that make?
What do you think is the main issue here?		What are your reasons for saying that?
Let me see if I understand you, do you mean...or.....?		

<p>How does this relate to the problem, discussion or issue?</p> <p>What do you Nomsa mean by this remark?</p> <p>What do you take Nomsa to mean by her remark?</p> <p>Thando, can you summarise in your own words what Sipiwe said?.....Sipiwe is this what you mean?</p> <p>Could you give me an example?</p> <p>Would this be an example.....?</p> <p>Could you explain this further?</p> <p>Why do you say that?</p>	<p>You seem to be assumingHow do you justify taking that for granted?</p> <p>Is that always the case?</p> <p>Why do you think the assumption holds here?</p> <p>Why would someone make that assumption?</p>	<p>What other information do you need?</p> <p>Could you explain your reasons to us?</p> <p>Are these reasons adequate?</p> <p>What led you to that belief?</p> <p>How does that apply to this case?</p> <p>Is there reason to doubt that evidence?</p> <p>How could we find out if that is true?</p> <p>By what reasoning did you come to that conclusion?</p>
<p>Question about Viewpoint or Perspectives</p>	<p>Questions that Probe Implications and Consequences</p>	<p>Questions about Questions</p>
<p>What are you implying by that?</p> <p>When you say..., are you implying...?</p>	<p>How can we find out?</p> <p>How would you state the issue?</p> <p>Is this issue important?</p>	<p>How could someone settle this question?</p> <p>Can we break this question down at all?</p>

But, if that happened, what else would happen as a result? Why?	What generalisations can you make?	Is this question clear? Do we understand it?
What effect would that have?	What are consequences of that assumption?	Do we agree that this is the question?
Would that necessarily happen or only possibly/probably happen?	How would our result be affected if...?	To answer this question what other questions must we answer first?
What is an alternative?		Would ... ask this question differently?
If...and....are the case, then what might also be true?		What does this question assume?
If we say that ... is ethical ... how about...?		

c) Reasoning



Reasoning was said to be another method that is used in the facilitation of critical thinking. It involves the use of reasoning strategies such as inductive, deductive, hypothetico-deductive and dialectical dialogic reasoning and these are described as such.

➤ *Inductive reasoning*

According to Heit and Rotello (2010: 805-812) induction is an important function of cognition. Inductive reasoning alone, or in combination with other forms of thinking, is central to many types of problem-solving and learning. Inductive processes are responsible for generating concepts and providing links between concepts and actions. Inductive reasoning refers to a cognitive process of when the premises of an argument provide only partial support for the conclusion.

It involves an inductive argument that claims that the premises are providing only some degree of probability, but not with certainty to its conclusion, the probability being a matter of degree, and dependent on what else may be the case.

Inductive reasoning involves moving from a specific data base to the formulation of a general principle. The principle moves from a particular set of causes or facts of experiences to the general laws or principles, or from the effect to the cause, which is not yet known or understood. The data at hand is used to arrive at a conclusion or generalisation.

In inductive arguments the conclusion probably follows from the reasons (Hinkel, 2011: 198-208). The critical thinker makes inductions from data gathered through their senses. In their minds they will then formulate categories and generalisations from phenomena encountered in the learning environment. Statements and arguments will then be formulated and judged as true or false, valid or invalid, relevant, plausible, cogent or sound and significant, through the reasoning process of induction. The focus in inductive reasoning is on the soundness or unsoundness of the constituent propositions that make up an argument (Kemp & Tenenbaum, 2009: 20).

Denecker and Ternovska (2008: 14) assert that inductive reasoning is a method of discovering properties from phenomena, and of finding regularities in a logical way. During inductive reasoning the learner derives predictions from hypotheses and matches them to the issue at hand, for example the learner may observe that Mrs White who is very obese and has undergone a back operation will be on strict bed rest for some time and may develop deep vein thrombosis due to bed rest and immobility. When a prediction is made, they match it with one specific aspect of the problem or issue at hand. The major feature of inductive reasoning is the learner's ability to rule out those hypotheses whose expected consequences turn out to be not in agreement with the problem or issue.

Denecker and Ternovska (2008: 14) further posits that inductive reasoning involves four stages, which are observation, organisation of particular cases, searching and prediction of pattern, conjecturing formulation, and conjecturing validation. Observation of a particular case involves the starting point being their experience with particular cases of the problem posed.

Organisation of a particular case involves the learner's use of different strategies to systematise and facilitate the work of particular cases. Searching and prediction of patterns involves observing particular cases organised or not while the learner is thinking about the next unknown case. They will think about a possible pattern just for the case observed or issued under consideration. At this moment they do not think about applying the pattern to all cases.

They will then formulate a conjecture. A conjecture is a statement based on empirical facts that have not been validated. The learner will make a statement about all possible cases, based on particular ones, but with an element of doubt. After this they will validate the conjecture. When the learners formulate a conjecture they are convinced about the truth of their conjecture for those specific cases, but not for other ones. They will try to validate the conjectures for a new specific case, but not in general. Furthermore, the learner will generalise conjectures based on a conjecture, which is true for some particular cases, and having validated such conjecture for new cases the learner may hypothesise that the conjecture is true in general (Heit & Rotello, 2010: 805-812).

According to Rasmussen and Eliasmith (2011: 140-153), inductive reasoning involves generalisation, which includes the cognitive operation of detecting similarity of attributes. After this the learner will, in their mind, discriminate attributes and cross-classify, which involves detecting similarities and differences in attributes. They will further recognise relationships by detecting similarities of relationships, and lastly differentiate relationships and construct systems by detecting similarities and differences in relationships. Inductive reasoning is a process of inferring a general rule by observation, and analysis of specific instances. Inductive argument is argument that focuses on the set of premises that form the body of the evidence that is said to confirm (support, warrant, ground, provide a reason to believe) the conclusion or hypothesis. It consists of providing a convincing, noncircular justification for making inferences, that is, an explanation. Induction can be seen as a process of "generalisation", whereby inferences are made from the observed evidence.

On the other hand, it can be seen to be hypothetico-deductive in that a conjecture of a hypothesis is made, making a prediction of an event that is entailed by the hypothesis, and further making a prediction of an observation of the occurrence or non-occurrence of that event, for example we may conjecture long-term exposure to asbestos causes asbestosis, if the hypothesis were true then we would expect that a patient who has been exposed to asbestos over a long period to have contracted asbestosis.

This would be a logical deduction from the hypothesis. If it is found that the expectation matches the observational findings of a specific patient, then the hypothesis would be confirmed by the evidence. Induction can also be seen as a probabilistic process, whereby the effect of the observed evidence is calculated on the degree of the belief in a hypothesis (Elstein, 2009: 7-18).

According to Rasmussen and Eliasmith (2011: 140-153) induction begins with a set of particular facts that are used to draw a conclusion. The learner uses induction to identify possible patterns in information and extends them to predict new information.

In inductive reasoning the learner assumes that what is true of a sufficient number of individual cases is true of all cases, or that when certain phenomena occur together they suggest a certain interpretation, for example they may deduce that all patients presenting with dyspnoea, tachypnoea, tachycardia, and cyanosis could be suffering from a respiratory disease. Reasoning involves an orientation to serve some purpose or goal.

This means that the critically thinking learner reasons to achieve a goal or fulfil a purpose. They will express their purpose or goal, and adjust their thinking to serve it. They will analyse and critique their purpose, and there should be realisation and recognition on their part of their point of view or frame of reference in which they are thinking.

The educator will then assess the learners' ability to handle the dimension of purpose against the relevant intellectual standards. They will follow their implications and the consequences of their reasoning. Reasoning relies on principles or theories to make sense of what one is reasoning about. It is based on some experience, evidence, or data that the thinker is using or basing their thinking on.

The learner will consider the question at issue using a point of view or frame of reference that forms the contextual aspect of their reasoning as a point of departure. This point of view should subscribe to the intellectual standards of being flexible, broad, and fair. Furthermore, reasoning has an empirical dimension, which constitutes the evidential aspect of such reasoning (Rasmussen & Eliasmith, 2011: 140-153).

The gathered evidence should be clear, fair, and accurate. There should also be a conceptual dimension to the learners reasoning in that reasoning involves the use of some ideas or concepts. The concepts can include theories, axioms, principles, and rules, and the understanding of such concepts should be deep and clear rather than superficial. They will identify their inferences and rationally argue and formulate and consider possible objections (Elder & Paul, 2008: 249). Therefore the learners will use their facilitated critical thinking skills to ascertain the strength of conclusions by examining the reasoning that informed such conclusions and logical relationships.

➤ *Deductive reasoning*

According to Rodriguez-Moreno and Hirsch (2009: 949-961), deductive reasoning is based on the principle of *a priori* logic, which departs from a general premise, the truth or validity of which is taken for granted in advance to some particular case, or from the cause which is already known and understood to that effect.

Deductive reasoning involves moving from testing of an existing conceptual framework. A deductive argument is one whose conclusion is said to follow from its premises with absolute necessity, the necessity not being a matter of degree, and not depending in any manner on whatever else may be the case (Ayalon & Even, 2008: 235-247).

The learner begins with a general statement, rule, or principle, and goes on to apply this to specific cases and instances. Deductive reasoning is useful to place values, facts, expressions, and propositions into formulas that generate inferences from initial premises. The deductive argument provides complete evidence for the conclusion, the premise, if assumed to be true, is sufficient to establish the truth of the conclusion.

In deductive argument there are reasons given in the premise for drawing a conclusion that is certain, as distinct from an argument that is probable or possible (Ayalon & Even, 2008: 235-247).

According to Monti, Parsons and Osherson (2009: 12554-12559) deductive inference is a process that involves two levels of mental representation. It is assumed to draw on all conceptual information in memory and on background assumptions. Through the reasoning process the learner whose critical thinking is facilitated will cognitively integrate the various elements of their knowledge base, rather than giving precedence to abstract formal knowledge. Logic enters the process of reasoning in the form of immediate implications and inconsistencies. The process furthermore requires no semantics, since it operates on beliefs not on truth and conditional statements.

They furthermore assert that the cognitive process of deduction is driven by a process that includes deductive schema that hinge on the logical form of premises and context-specific pragmatically based inferential rules (pragmatic schemas and their variants). It also includes processes relying on mental representations of meaning, or mental models, or world knowledge and beliefs, as opposed to any deductive principles.

Deduction is said to draw on two distinct levels of mental representations which involves the learner's use of permanent knowledge, including a set of deductive schemas based on logic, among other knowledge domains such as concepts and semantic relations, and the functional representation of the problem in their working memory, where the actual deductive work is done for a specific inference. Recognising the logical form of a problem entails a formalisation process that exploits the cues, semantics, and contextual cues. A representation highlighting the logical form of the statement, among other aspects of meaning, will serve as explicit input into the pertinent deductive schema (Monti et al, 2009: 12554-12559).

The learner's logical knowledge controls the ongoing construction of the functional representations and provides them with a theoretical structure for empirically considering how content and knowledge articulate in deduction. Deduction proceeds from explicit premises and context jointly through inference schemas and contextual assumptions, whose strength is directed by new information, although this assumption needs to be enriched, as premises may be left unstated by others (Monti et al, 2009: 12554-12559).

Johnson-Laird (2008: 206-222) asserts that the importance of deductive reasoning is its centrality among other modes of thought. Explanations of the learner's statements and actions presuppose some degree of logical consistency. In their mind, the learner whose critical thinking is facilitated will use content-specific conditional rules to make inferences from general knowledge. What happens is that one inference will call to mind another. When an activity has been repeated often enough it will begin to function like a content-specific rule. A key feature of deduction is the use of suppositions, which are assumptions made for the sake of argument. One way to use a supposition is to show, that together with the premises, it leads to a contradiction and must therefore be false.

The learner will understand the meaning of assertions, envisage the corresponding situations, and ascertain whether a conclusion holds in them. Mental models used by the learner are based not on syntactic derivations, but on manipulations of mental models. According to Heit and Rotello (2010: 805-812) during deductive judgment the learners' cognitive reasoning activities will be influenced by slower analytic processes that encompass more deliberative, and typically more accurate reasoning.

Deductive reasoning begins with a principle, generalisation, or a major idea, and proceeds to discover or predicts specific facts based on that general idea, for example the learner may be asked to analyse Leininger's culture care theory and apply it to a specific nursing situation.

➤ *Hypothetico-deductive reasoning*

Hypothetico-deductive reasoning involves a reasoning process whereby problems are resolved by generating hypotheses and verification. The critical thinker consistently generates hypotheses on the basis of limited data.

The hypotheses gets accepted or refuted as new data is gathered. For example, the learner collects data by history, physical examination, diagnostic procedures, and laboratory tests. This information forms a basis for generating hypotheses. The hypothetico-deductive reasoning process is centred on the cognitive activities of cue acquisition, hypothesis generation, cue interpretation, and hypothesis evaluation.

The accuracy of a solution depends on generating sufficient hypotheses, using knowledge to recognise the kind and amount of data needed to confirm or rule out each hypothesis, securing the required data, and making accurate interpretations and decisions based on evidence (Mahootian & Eastman, 2008: 61-75). According to Elstein (2009: 7-18) hypothetico-deductive reasoning involves a process where the learner whose critical thinking is facilitated is presented with a problem. A process of hypotheses generation will be initiated in the learner's mind. Inquiry will take place against these hypotheses, and learners will use the data they have gathered to in or out hypotheses until they reach a decision. Inquiring against hypotheses may take many forms and may be derived from different sources, for example a patient presenting with a health problem, or a literature search for information.

Regardless of the form or source, cognitive processes across forms of problems are said to be similar, in that the problem presents in a similar manner itself and the hypotheses are generated in the mind, or a cognitive search for hypotheses is initiated. Inquiry addresses these questions through a systematic but nonlinear process of testing the hypothesis against the accumulating data. As the process continues in the learner's mind, new hypotheses are generated, and new questions and strategies to further test the hypotheses may come to mind, calling for further inquiry. The process may be exhausted with a conclusion. Sometimes a need for action may demand that the learner looks for the best possible decision, based on the evidence at hand. Hypothetico-deduction enables the learner to compose a causal scientific question, give an explanation, or formulate a hypothesis, predict results or expectations, and come to a conclusion (Elstein, 2009: 7-18).

➤ *Dialectic dialogical reasoning*

Dialogic reasoning involves an extended exchange between differing points of view or frames of reference. Wegerif (2008: 347-361) asserts that learners learn well in dialogical situations where they are allowed to engage in dialogue with fellow learners, and are encouraged to continually express their point of view. During this process, issues are examined from multiple perspectives with the aim of highlighting complexities, moving between one's ideas to those of others with an openness to consider other ideas, and to revise one's thinking in light of new information. Dialogic reasoning means information is made available for analysis and evaluation. Maintaining openness to reason about one's own thoughts in relation to the perspective of others, keeps one's egocentric perspective in check. The dialogic process is not merely to state diverse opinions or understanding and appreciating others perspective, nor is it built on the notion that all views are equally valid, instead positions are to be well thought out by the learners.

Akbari (2008: 276-283) refers to what critical theorists call a "critical pedagogy", in which they argue that it is informed by dialogue that moves the learners and the educator away from a deterministic subject-object way of knowing, which is characterised by strategies geared towards instrumental rationality.

It refers rather to a situation envisaged where otherwise manipulative strategies associated with instrumental rationality should be openly and relevantly incorporated into the programme. This communicative context should entail a deliberate intention in the "give" and "take" of reasoned careful conversation between the educator and the learner.

The interaction should be based on argument and predisposition to engage both critically and respectfully with the views of others. The focal point is dialogue. The argument is that without dialogue there can be no authentic education. Dialogue joins the educator and the learners in this programme in a purposeful attempt to reach a common understanding about their shared reality with a view to changing it for the mutual benefit of facilitating the learners' critical thinking skills. In the first instance, dialogue requires thoughtful participation and commitment by the educator to the humanisation of the educator/learner's relationship.

The learning environment should enhance a culture of intellectual challenge and argument between the educator and learners. The learners must see the educator move from knowing to doing, and vice versa. Seeing the educator engage in critical thinking will motivate the learners to engage in the process of critical thinking without fear of being ridiculed (Forneris & Peden-McAlpine, 2009: 1715-1724).

According to McKee (2010: 100-109) dialogue as a communicative educational drive is characterised by exploration and interrogation. The process of talking aids the learner to clarify their thoughts, and those listening get the opportunity to reflect on alternatives to their own perspectives in as far as the content is concerned. The purpose is to arrive at new insights, and it implies a co-operative process and reciprocal inquiry. It requires a commitment to dialogue and the educator should ensure that the learning environment fosters engagement of the learners in the teaching/learning process. This dialectic dialogic interaction also involves collaboration that is driven by interactive facilitation of the learners' critical thinking. In a dialogical and collaborative educational climate there is an explicit attitude of reciprocity among the learners, underpinned by the interest, trust, respect, and concern they share for one another, even when there is disagreement or misunderstanding. Such an environment is ideal for facilitating critical thinking.

The educator in the anticipated programme needs to ensure that there is more of learner talking, collaboration, and co-operation characterised by interactive facilitation as the dominant driving force of the learning context. Evans (2008: 255-278) asserts that reasoning can also be dialogic in that it involves examining issues from multiple perspectives that assists the critical thinker in highlighting complexities, moving from their own ideas and those of others while maintaining an openness to consider other ideas and revise their thinking in light of the new information. Furthermore, dialogical reasoning means that the learner has more information at their disposal for analysis and evaluation. Keeping open to reason about their own thoughts in relation to the perspective of fellow learners eliminates the learner's egocentric tendencies.

The critically thinking learner will entertain the thought that they may be wrong and should be willing to adapt their thinking in light of new information. In dialogic reasoning the learner should realise that the purpose is not just to think about the viewpoint of others, but also to examine their own ideas and those of others in the quest to seek out the truth.

According to Armstrong (2011: 1-25), mental contradictions occur in the learner's mind during interaction with others, and knowledge is constructed to quiet the disequilibrium created by contradictions that arise in the interaction. Freely and Sternberg (2009: 152) are of the opinion that dialectical dialogue involves philosophical inquiry in which a question-response process is followed. This process is guided by rules of formal logic, in which the interlocutor begins with a set of questions in their search for answers and truth.

d) Argumentation

Argumentation is the central method used to evaluate the evidence at hand and the reasoning behind the process used to get to the results. An argument is simply a claim, used to persuade others, that something is (or is not) true and should (or should not) be done. When someone gives reasons for believing something – hoping that another person will come to the same conclusion by considering those reasons – the discourse is geared toward persuasion. Not every claim is an argument. Some statements are merely factual information. For example, to say that the femur is a long bone, there is nothing to argue about, since it is an easily verifiable fact.

However, the assertion that broncho-spasm is caused by infection moves into the realm of argument because it involves a disputable claim. An argument contains three basic elements: an issue, one or more reasons called premises in logic, and one or more conclusions. Unless the learner is able to distinguish among the elements of the argument, they are in danger of accepting fallacious arguments (Modgil, 2009: 901-934). Premises are the reasons given in an argument to support the conclusion.

As statements that present the evidence, premises answer the question why we should believe a claim. In someone's attempt to persuade, the conclusion is the statement that presents the point to be proven. In other words, it is essentially the arguer's decision about the issue, and it answers the question presented by the issue. The learner cannot analyse the reasoning unless they can first identify the conclusion. Arguments can be valid or invalid, based on how they are structured. Arguments are not true or false, only premises and conclusions are true or false.

The goal of a critical thinker is to develop sound arguments that have both validity (are structured properly) and true premises (Modgil, 2009: 901-934). In critical thinking, arguments refer to a proposition with its supporting evidence and reasoning. Osborne (2010: 463-466) asserts that the purpose of an argument is to persuade or convince. An argument is a connected series of statements or propositions, some of which are intended to provide support, justification, or evidence for the truth of another statement or proposition. Arguments consist of one or more premises and a conclusion. The premises are those statements that are taken to provide the support or evidence; the conclusion being that which the premises allegedly support.

Arguments are related to inference and reasoning, i.e. the psychological process through which a person forms a new belief on the basis of other beliefs. It contains a body of evidence in relation to some proposition, while the proposition is expressed in some claim. Arguments are the main tools of reasoning as they attempt to bring one to believe the truth of a claim by giving reasons to do so. A course of reasoning can usually be reconstructed as an argument. An argument is designed to persuade a resistant audience to accept a claim through the presentation of evidence.

Arguments can be deductive or inductive. Deductive arguments are those arguments that aim at validity, they attempt to reason to believe the truth of a conclusion by bringing forth truth-preserving arguments. On the other hand, inductive arguments attempt to give premises that entail the truth of the conclusion, with the aim of generalising from the evidence (Gorogiannis & Hunter, 2011: 1479-1497).

Through the process of argument the learner will avoid being led astray in their beliefs while maintaining an open mind to those of others in the pursuit of the truth. For example in this programme, argument will stimulate retrieval of images of patient encounters that are used as comparative analytic templates with the patient's clinical picture, in arguing a claim. The past patient encounters that are stored in the learners' minds are compared and contrasted with the patient instance they are faced with, to identify similarities and differences. A good argument is one that is organised, elaborated, and supported by evidence or personal experiences.

The educator may also use an advance organiser to organise the learners' argumentation. The learners may be presented with an ill-defined problem to solve, and be allowed to form an argument for their preferred solution and reasons against alternative solutions. This engages the learners in a process of argumentation and counter-argumentation while using critical thinking operations, like determining the accuracy of statements, identifying claims or arguments, identifying unstated assumptions, and assessing the strength of a claim or argument (Gorogiannis & Hunter, 2011: 1479-1497).

Gorogiannis and Hunter (2011: 1479-1497) further assert that good arguments are multifaceted, an instance that presents learners with the opportunity to engage in deeper processing while employing their facilitated critical thinking skills. The likelihood is that the learner will use their critical thinking skills when they consider counter-arguments from fellow learners to their own, and integrate their arguments and counter-arguments into an overall final position.

The learners should be encouraged to consider and rebut opposing sides in order to increase the persuasiveness of their arguments. Argument and counter-argument integration is central to critical thinking as it involves a dialogic exercise that employs an open-mindedness that considers counter-arguments.

The learners will use arguments to justify the outcomes of their thinking, whether the outcomes are solutions, conclusions, hypotheses, factual claims, judgments, or decisions that claimed to be true, accurate, or correct. Therefore, in facilitating their critical thinking skills, the learners should develop the skills of identifying arguments and distinguishing them from descriptions and explanations. They will also acquire the skill of evaluating and constructing arguments. To evaluate arguments the learners should look at what the argument is trying to convince of and its conclusion. They will evaluate the information offered as reasons that support the conclusion and if this information is accurate and reliable. To determine whether the argument is strong or weak they will evaluate if the reasons are accurate or sufficient to convince of the conclusion (Swartz, 2008: 208-216).

➤ *Debate*

The educator can also use debate as a methodology to facilitate the learners' critical thinking. Bennett, Maton and Kervin (2008: 775-786) asserts that debate is a "systemic contest of speakers in which two points of view are advanced with proof". It affords the learners an opportunity to undertake an in-depth and objective analysis of an issue or problem in order to reach an informed and unbiased conclusion or resolution. Through debate the learner goes beyond merely identifying an issue. As they analyse the patient's health problems and how to address them, they ask salient questions such as "what are the key elements?", "what antecedents contributed to the health problems?"

Analysis on this level leads to powerful learning, calling for the use of reasoning and other forms of higher order thinking, such as critical thinking. The strategy is used to facilitate the learners' ability to employ critical thinking skills, systemically critique issues, and arrive at salient points.

It aids facilitating the learners' oral communication, structuring and presenting an argument, and exercising analytical skills that are necessary for critical thinking. The learning process also includes assessment of the learners to determine whether or not the learning outcomes have been achieved. According to Doody and Condon (2012: 232-237) and Cranton (2008: 68), critical thinkers use debate and questioning to get to the core of assertions and assumptions before coming to conclusions.

Debate provides a mechanism for expression of opinions through persuasive arguments and prompt analytical rebuttals. Preparation for debate and the debating process incorporates tenets of critical thinking. It prescribes comprehensive examination and articulation of a particular stance on an issue.

During a debate the learners engage in active speaking and listening. The learners hold contrasting views on a controversial issue presented to them, and debate it taking a stance that is opposite their own. They are exposed to divergent but substantiated points of view that encourage open-mindedness, tolerance of diversity, and a common understanding. The learners are enabled to form educated opinions with greater certainty and conviction. They are also assisted to examine their own perspective on an issue.

Debate promotes critical thinking in that the learners' literature searching skills, weighing risk, and making evidence-based decisions are improved. Debate is a "pro" and "con" argument of a specific assertion, proposition, or solution to a problem. Debaters provide a reasoned argument for or against a matter of concern (Doody et al, 2012: 232-237; Cranton, 2008: 68).

According to Hall (2011: 16-19), the use of debate in facilitating critical thinking has the ability to reinforce the learners' ability to analyse, incorporate, and apply literature to various situations to heighten organisation and listening skills and to boost their self-confidence when challenged on issues by others. Through debate the learners' clinical reasoning and critical thinking is enhanced, and awareness of their attitudes, values, and beliefs is increased. The learners will use debate to advocate their stance while they simultaneously acknowledge the opposing arguments, counter-arguments, and refute their claims with a logical line of critical thought. The mental activity of being able to consider evidence in different ways and under different circumstances will aid the learner in developing critical thinking skills.

Debate will move the learners from memorisation and superficial application of theories, techniques, and evidence to actively integrate and apply their facilitated critical thinking skills to different situations. During the use of debate the learner weighs the pros and cons of both sides of an issue by reflecting on their own views while thoroughly investigating the other perspective. Hall (2011: 16-19) further asserts that debate challenges the learner to not only thoroughly research and examine their own perspective of the issue under consideration using various logic and problem-solving skills, but also to become familiar with and prepare for the possible counter-argument from others, in order to defend their viewpoint. To facilitate the learners' critical thinking skills using debate, the educator needs to give the learners logic topics such as propositions, probabilities, errors in reasoning, and value judgment.

According to Osborne (2010: 463-466), debate teaches the learners to organise their arguments while constructing and examining the macro and micro aspect of argumentation. These skills help the learner through complex decision-making situations. Through debate they learn critical listening skills, and discover flaws in opponents thinking and evidence.

On the other hand, Bradshaw and Lowenstein (2011: 163-171) assert that debate encourages the learner to identify the essential nature of an issue as substantiated by evidence, to establish criteria for judging its successful resolution, to weigh, compare, and contrast the merits of alternative strategies for resolution. Through debate the learner will be able to examine the position juxtaposed to a personally held view. The learner is enabled to go beyond merely identifying the issue. They learn how personal values and emotions influence thinking and responses to the issue. Vargo (2012: 2) is of the opinion that the use of debate in the learning area should focus on aspects that strengthen the learners' own arguments. The use of debate enhances the cognitive process of considering multiple viewpoints and arriving at a judgment.

The learners will be moved from beyond acquisition of basic knowledge in a subject matter, and progress into the type of higher order critical thinking facilitated by debate. There are several methods of debate that may be used in class to facilitate the learners' critical thinking. These are the four corner debate, role-play debate, fishbowl debate, think-pair-share debate, meeting house debate, and problem-solving debate. Debate also eliminates dualism in the learners' minds, and they come to realise that there are always multiple perspectives to an issue. Debate is useful as a prelude to argumentation, argumentative papers, or examination.

e) Cooperative/collaborative learning

Co-operative learning strategies are a cluster of teaching strategies that involve learners working collaboratively with each other to achieve the learning outcomes. In the co-operative learning experience the educator shares authority with the learners while holding them responsible for their learning. In certain instances the educator may give direct instruction in a skill or concept, while taking care not to interfere with group work or discussion.

Co-operative learning is an interactive strategy that stimulates critical thinking, fosters a feeling of togetherness within the group, and promotes individual responsibility for learning through group interaction. This strategy contributes to increased learner involvement and participation, enhances the facilitation of critical thinking through dialogical and collaborative interaction, and promotes the responsibility for learning (Coakes, Coakes & Rosenberg, 2008: 12-25). In co-operative learning the educator needs to aim for achieving the learning outcomes and prevent group disintegration. The learners complement each other as each group member plays the role of a leader at different times. The educator ensures that group activities are structured accurately in writing to avoid confusion. Furthermore, the educator needs to foster positive interdependence, which culminates in the learners taking co-ownership and co-responsibility for the learning experience. The educator assists, supports, encourages, and intervenes where necessary, this is encompassed in the mediatory role of the educator.

Slavin (2011: 160-166) describes these intervention strategies as prescription, whereby the educator intervenes with the aim of directing a learner's behaviour if they feel that their behaviour does not contribute to the group function. The intervention can also be informative, where the purpose is to provide information in instances where lack of information is a barrier to group function.

Furthermore, the educator can intervene using the confrontational strategy, even though it is supportive it is aimed at addressing negative attitudes and behaviour on the part of the learners. Cathartic intervention is aimed at defusing emotions such as anger, anxiety, and confusion, to enable the learners to manage these emotions in a manner that will not destabilise group cohesion. A further intervention is catalytic, whereby the learners are enabled to learn and develop their critical thinking skills through self-discovery.

Furthermore, Slavin (2011: 160-166) maintains that it is a supportive strategy in which the focus is on enhancing the learners' positive self-image. Feedback throughout the process of teaching/learning is of utmost importance. In a co-operative learning climate the learners are afforded an opportunity to practice skills such as active and tolerant listening, helping one another master the content, giving and receiving constructive criticism, and managing disagreement, which are some of the most important dispositions required for facilitating critical thinking.

Cooperative learning enhances student learning by providing a shared cognitive set of information between learners, motivating them to learn, and ensures that the learners construct their own knowledge. Furthermore, it enhances the provision of formative feedback, the development of social and group skills necessary for success outside the learning environment, and promotion of positive interaction between learners of different cultural and socio-economic groups (Shimazoe & Aldrich, 2010: 52-57). The trans-cultural transaction between the learners in the cooperative groups enhances facilitating culture-sensitive nursing education, which is largely characterised by critical thinking processes in that it creates a climate conducive to group interaction that fosters open-mindedness, freedom of choice, mutual respect, trust, empathy, and tolerance.

The learners are also encouraged to persevere and accommodate diverse cultures through exploration of cultural differences in perceptions, beliefs, and values within the cooperative groups (Barker, Quennerstedt & Annerstedt, 2013: 1-18). Language is the other important aspect of cooperative learning, in that it enables the learner to construct an understanding of the content for themselves. Through language the learners are able to facilitate their own cognitive growth.

The educator also needs to examine their learning environment language, and ensure that it encourages thinking. Thoughtful use of cognitive language in the learning environment is vital in that through it, the learners' critical thinking will be facilitated (Costa, 2008: 251-254).

The value of cooperative learning environments is that these are settings where the learners work together in groups to accomplish significant cooperative tasks. They are settings where the learners are likely to attain higher levels of achievement, to increase time on tasks, to build trans-cultural friendships and tolerance of diversity, to experience enhanced self-esteem, to build life-long interaction and communication skills, and to master the habits of mind (critical, creative, and self-regulated) that are needed to function as productive members of society. Co-operative learning leads to meaningful learning and stimulates peer interaction and learner-to-learner co-operation in the process of fostering successful facilitation of critical thinking (Barker et al., 2013: 1-18).

The value of cooperative learning is that it promotes a social atmosphere of interaction, which is characterised by dialogue among the learners. The learners appreciate diversity in the learning environment whereby co-operation is characterised by face-to-face interaction, positive interdependence, and a feeling of individual accountability (Gillies & Boyle, 2010: 933-940).

Cooperative learning allows for reflective leadership in that all understand, learn, and perform leadership tasks. There should be no domination of each other, as all have equal status. The democratic principles that prevail boosts the learners' morale and self-esteem. The checker ensures that the group members can explain how they arrived at a conclusion and summarises the group conclusion. The educator should ensure that the groups are heterogenous, autonomous, and self-reliant.

Emphasis should be placed on the group outcomes, and the learners need to know why they have to learn in a particular way, and that they should share responsibility and never lose sight of the task at hand in the learning process. Cooperative learning strategies include jigsaw and think-pair-share, among other strategies. The benefit of cooperative learning is the development of critical thinking skills with increased self-esteem. The educator should structure the groups to maximise interdependence and mediate facilitating critical thinking by using Socratic questioning, responding non-judgmentally, and inviting group metacognition. Furthermore, they should process the cooperative exercise by reflecting on and labelling action, to see whether it fits critical thinking (Gillies et al, 2010: 933-940).

Cooperative/ collaborative learning is integrated in the methods used in the implementation of this programme. Metacognition involves a combination of explicit and implicit processes. It involves control and monitoring of cognitive processes. Monitoring consists of assessing information about one's knowledge and performance. Monitoring processes do not inherently require conscious awareness. Control involves self-regulative processes that direct and modify one's behaviour, such as processes that govern the selection of strategies for accomplishment of a task (Azevedo, 2009: 87-95). Therefore, the learner in the envisaged programme will use or consider these methodological aspects when using their facilitated critical thinking skills to deal with practice issues in the learning area.

4.2.4.3 Evidential dimension

According to Bennett, Maton and Kervin (2008: 775-786) evidence is a piece of information that supports a conclusion. It can be defined as that which is considered or interpreted in order to draw or infer a conclusion about some aspect of the world. Evidential considerations are based on a process of looking at the evidence at hand or in mind, as it can either be personal experience, observation, from literature, or making a decision. It is data on which a judgment or conclusion might be based on proof or probability. Evidential considerations involve investigative skills, justification, and the provision of a trail of evidence as skills necessary for supporting claims and arguments. Critical thinkers use the skills of identification and evaluation of evidence to guide decision-making.

The learner whose critical thinking is facilitated will use broad in-depth analysis of evidence to make decisions, and communicate their beliefs clearly and accurately. According to Bennett et al (2008: 775-786), the learner whose critical thinking is facilitated will distinguish evidence or raw data upon which they base their explanation or conclusions from inferences and assumptions that connect data to conclusions. It is a statement of case or a counter statement by which the learner is giving evidence that shows a precedent for what they are saying, and that which they are using as support for a conclusion is not fantasy. Fantasy refers to private, subjective content and function that is relatively free of the constraints of objective reality considerations (Seymour, 2008: 182-188).

The learner whose critical thinking is facilitated will demonstrate how their conclusion proves the result or is derived from certain facts or events, and that even those who disagree with their conclusions can see or experience for themselves. They will further clarify their position or standpoint by using analogy or comparison. These examples will not need verification when supported by evidence. An analogy is drawing comparisons between different factors in two dissimilar things to help illustrate or clarify one of the two. One of the two is usually chosen because it is basically understood by the listener, and thus the one that is not understood can be made clear.

Therefore the learners will use evidential considerations to explain the assumptions they make about problems that require them to produce solutions. The evidential consideration will enable them to further explain conclusions they reach as they draw inferences from the data at hand, and instances as well as arguments that are posed by fellow learners. Evidence includes processes of justification, investigation, and trail of evidence, which are described below. Critical thinking forms the cornerstone of evidence-based practice and for the learner to assess the evidence for relevance, accuracy, completeness among others.

a) Justification



According to Renne (2012: 43-82) justification is the act of providing evidence to support one's judgments or decisions. It involves activating a justification goal, followed by strategically searching for, and evaluation of information. Like other information-processing goals, justification will shape the learner's mental representation as they provide justification for their decisions or judgments. The learner whose critical thinking is facilitated will integrate justification goals into their mental representation as soon as they perceive that their judgment or decision needs support. While the learner may rely on many cues that are coming to their mind as they justify their decisions, they will use heuristics that significantly constrain the cues used.

Gigerenzer (2008: 20-29) asserted that heuristics are simple, efficient rules that are hard-coded by evolutionary processes or learned, which have been proposed to explain how people make decisions, come to judgments, and solve problems when facing complex problems or incomplete information.

However, the learner whose critical thinking skills are facilitated will guard against cognitive bias. Heuristics may be used to reduce the complexity of clinical judgment. Cognitive heuristics work by a process called attribute substitution, which occurs without conscious awareness. For example the learner may deal with a cognitively difficult problem by answering a simpler problem, without being aware that this is happening. Bennett et al (2008: 775-786) asserts that justification is based on what one believes to be true or not. In the context of this study, justification is about defending and giving explanations about reasoning behind judgments, clinical decisions, and nursing interventions that the learners use to solve health problems.

The learners will justify their beliefs by reference to authoritative views. In areas where answers do not exist, beliefs are defended as personal opinions, since the link between the evidence and beliefs are unclear. The learners' beliefs are justified within a particular context by means of inquiry for the specific context and through context-specific interpretations of evidence. Specific beliefs are assumed to be context-specific or are balanced against other interpretations. The learners will justify their beliefs based on the weight of the evidence at hand, explanatory value of interpretations, the risk of erroneous conclusions, consequences of alternatives, judgments and the interrelation of these factors. There are two factors that affect the degree of justification: the risk of adding false beliefs and the potential gain in truth beliefs, in probabilistic terms. The risk of increasing false beliefs is inversely related to the conditional probability of the proposition, given the evidence. They will defend their conclusions as representing the most compelling understanding of an issue, not on the basis of the available evidence (Bennett et al 2008: 775-786).

According to Basu and Palazzo (2008: 122-136), justification has two fundamental dimensions. The first dimension is the distinction between justifications as an internal or external process. The second dimension points to whether justification is based on procedure or performance. The classification is to reveal the underlying logic behind different principles of justification.

External justification: The principle of foundations

Basu and Palazzo (2008: 122-136) assert that the thought of objective reasons for justification will reveal the learner's understanding of the reality that needs to be investigated by them during facilitating their critical thinking. In order to find proper justification for their beliefs, the learner will exit their subjective ideas and refer to reliable causes in general reality. The process of justification will connect the learner to the learning environment, be it experience or reason that can be objectively assessed.

Internal justification: The principle of coherence

In internal justification, Basu and Palazzo (2008: 122-136) posit that adopting an internalistic view rejects the possibility of foundations for knowledge claims. In this context, justification is seen as an inherently systematic activity where the important criterion becomes a belief's coherence with the body of beliefs already carried by the learner in the envisaged programme.

The coherence theory of empirical knowledge holds that the justification of particular empirical beliefs is always inferential in nature, and that there can, in principle, be no basic empirical beliefs and no foundation for empirical knowledge. Therefore, the learner is seen as having a system of beliefs including ontological and epistemological assumptions. In the absence of conclusive reasons during justification, the most the learner will do is to give internally congruent reasons for beliefs they hold in relation to their arguments and claims. An internal justification for a knowledge claim will therefore be in contrast to the external one, dependent on other beliefs the learner holds.

Justification procedure: The principle of reason

Basu and Palazzo (2008: 122-136) further assert that in the philosophy of science, explanations of knowledge lean towards rationalistic assumptions. Rationality suggests that the learner's justification will consist of an inherent argumentation, reason, and testing in the pursuit of knowledge as they use their facilitated critical thinking.

The learner will use the hypothetico-deductive reasoning in their rational pursuit of knowledge. A central concept of this justification process is the procedure in which they present their argument, for example how they use data gathered to strengthen their justification. During provision of evidence the learner whose critical thinking is facilitated will demonstrate the logic of how they deduced hypotheses, and the manner in which these hypotheses have been confronted with empirical facts that provides argument and justification for their knowledge claims.

Following the justification procedure, the learner will certify the knowledge claim, making it understood by others, reproducible, and possible to evaluate, for example the learner can justify why placing a patient in Fowler's position will relieve their breathing difficulty. The process of inference will guide the procedure of rational justification by the learner, and an outcome of this process will be the formulation of theories, models, and other abstractions.

On the other hand, Muller (2013: 1049-1068) argues that the learner will have a justified belief only if they have reflective access to evidence that the belief they hold is true. This means that there is epistemic justification for a belief only where the learner has cognitive access to evidence that supports the truth of the belief they hold. The learner whose critical thinking is facilitated will form their justifications responsibly, produce it reliably, and be such that they have enough evidence to support their justification. Their justification will also be formed based on internally accessible evidence and will allow for evaluation on how well the learner has pursued epistemologic goals. There is a definite connection of knowledge with internalism and evidence. Justification is therefore the reason why the learner holds a belief, the explanation as to why the belief is true, or an account of how they know what they know.

According to Staples and Bartlo (2010: 1-10), justification has many purposes. It is used to validate claims, provide insights into a result or phenomenon, and systematise knowledge. Justification further promotes conceptual understanding, fosters critical thinking skills and dispositions, and deepens learning, especially of concepts in the learner whose critical thinking skills are facilitated. During justification the learner will consider key ideas, make connections, and gain new insight.

The means by which they justify includes hearing others explain to clarifying their own thinking in an attempt to articulate their ideas. Through the process of justification, the learner will figure out for themselves how and why one thing works and others do not. Justification helps the learner to develop communication and representational skills, as well as creating connections across representations. Therefore the learner will through justification learn perseverance, independence, critical thinking skills, and the habit of mind to support their ideas.

b) Investigation

Investigative skills were cited as being important in facilitating critical thinking. The learner uses their investigative skills to gather information during assessment where there is not enough information to make rational decisions. Investigation involves examination or inquiry. Investigation leads the learner to use their facilitated critical thinking skills in forecasting or predicting based on the gathered information at hand. This inquiry is done with the aim of gathering adequate evidence to support their claims, and to use as a benchmark to validate the claims of others. The investigative process follows and answers the question “who”, “what”, “where”, and “how”, (Bruce et al. 2011: 283-284).

According to Klopfer and Squire (2008: 203-228), during investigation the learner will assimilate incoming information and draw inferences from it. With the support of fellow learners, the learner will then continually analyse the relevance and importance of new data that is collected during the investigative process, while using their facilitated critical thinking skills to further draw inferences and develop new hypotheses.

Furthermore, the learner may decide to assess the information at hand and to do this they will first formulate investigative strategies. Using their facilitated critical thinking skills they will then establish the relevance, reliability, and validity of the collected data. Following this they will mentally select appropriate lines of enquiry, which includes developing and testing investigative hypotheses, identifying and prioritising knowledge to obtain, and the resources required.

Finally, they will make decisions based on what is relevant to the investigation rather than on the basis of unsubstantiated assumptions. The collected evidence will then be integrated into the investigation and interpreted. Evidence is important in the learning environment in that it informs teaching/learning, rather than being seen as a reflection of the capability of the individual learner that is most useful for sorting, labelling, and appraising information. Decisions in the learning area are based on best available, current, valid, and relevant evidence. The learner whose critical thinking skills are facilitated will exhibit a critical attitude when they appraise evidence, so as to be able to provide relevant and individualised care based on evidence (Klopfer & Squire, 2008: 203-228).

On the other hand, Dougherty (2009: 102) assert that during the investigative process the learner will identify and define a problem. Following the investigation they will use their facilitated critical thinking skills to seek for ideas and explanations, brainstorm to generate possibilities and make interpretations, search for possible causes, and compare and pass judgment on the evidence they have, while maintaining a tendency to be constantly on the lookout for logical and factual flaws in their thinking and fellow learners' reasoning when generating new ideas.

Whereas, Geelan and Fan (2014: 249-270), investigation includes a framework consisting of three steps, firstly problem-posing that will include the learner recognising potential issues. Having done this, the learner will embark on brainstorming with others in order to define the problem. The learner will then identify the information searched for, and the resources for this information. They may also use their facilitated critical thinking skills to pose specific questions, define, and specify the focus of the investigation, and define the problem further by consulting their peers.

The next step would be problem-solving, whereby the learner obtains additional sources of information and share their views and opinions with fellow learners while defining the problem further, and cognitively managing the collected information. In the final step, the learner will encourage their peers by presenting a conclusion of the investigation and develop a scientific analyses or report. The learner may use debate to present their conclusion.

c) Trail of evidence

The participants were of the opinion that it is important to get the learners into the habit of *“giving reasons for their actions, decisions or choice of treatment in order to get them used to regularly recognise patterns in the presented evidence, look for relationships in the data, formulate hypothesis based on the evidence, provide explanations and draw conclusions”*.

Through critical thinking the learner will trace and seek the information relevant to the question they are attempting to answer, problems they are trying to solve, or issues they are looking at resolving. The learner should routinely evaluate the information for accuracy.

They will make sure they are considering all of the important information before attempting to answer questions and that they have enough information to answer the question. The learner should be encouraged to routinely analyse and assess the information used by others. Through outlining the trail of evidence in their claims, they will distinguish facts, information, experience, research data, and evidence. Trail of evidence will enable them to draw conclusions only to the extent that those conclusions are supported by facts and sound reasoning. They should be able to demonstrate the ability to objectively analyse and assess information in reaching conclusions based on the information they have (Webb, 2009: 1-28).

4.2.4.4 Criteriological dimension

Criteriological considerations are based on the use of intellectual standards that are used to assess critical thinking. The empirical data enumerated logical coherence, clarity, completeness, depth, breadth, and relevance as the standards used to evaluate the learners' critical thinking.

Reddy and Andrade (2010: 435-448) asserts that critical thinking is a unique kind of purposeful thinking in which the critical thinker systematically and habitually imposes criteria and standards upon the thinking, taking charge of the construction of thinking, guiding the construction of the thinking according to the standards, and assessing the effectiveness of the thinking according to the purpose, the criteria, and standards. During the mental processing of data, the critical thinker also critically examines the information at hand to judge its worth, reliability, and validity.

It is thinking that involves the use of criteria and intellectual standards on the thinking which is identification of solid reasoning, including precision, relevance, depth, accuracy, logic, and establishes a clear standard by which the effectiveness of the thinking will be finally assessed. The thinker maintains an awareness of the elements of thought, such as assumptions and point of view that are present in all well-reasoned thinking, making a conscious, active, and disciplined effort to address each element.

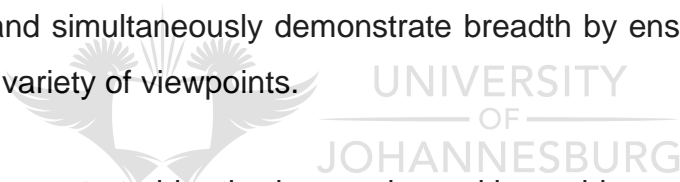
They continually assess the course of construction during the process, adjusting, adapting, and improving using the criteria and standards to direct the thinking while deliberately assessing the thinking to determine its strengths and limitations according to the defining purpose, criteria, and standards, as well as studying the implications for further thinking and improvement. These standards are used to judge and cognitively manipulate the argument to discover or make connections, patterns, and relationships within and among the input and emerging thoughts about it. Each critical thinking process contains both analysis and evaluation. This means that each cognitive process in critical thinking involves taking information apart in order to gather evidence related to particular criteria, followed by judging the extent to which what has been found meets the criteria implied by the skill (Molee, Henry, Sessa & McKinney-Prupis, 2010: 239-257).

For example in trying to determine if an argument is relevant to the discussion at hand, the learner may decide to nurse a patient with a health problem that alters their breathing by placing the patient in Fowler's position to improve the breathing pattern. The learner will take the argument apart and judge how closely it supports the claim, using the criteria above (McNeill, 2009: 233-268). The educator should assess whether the learners routinely seek to determine the strengths and weaknesses of their thinking and that of others.

The learners should have a deep understanding of their intellectual standards and how they differ from those of their fellow learners. The educator and the learners should know when a particular standard should be used to assess thinking in context. The critically thinking learner will clarify their thinking by adequately stating, elaborating, exemplifying, and illustrating it in multiple contexts.

The learner will examine their thinking for accuracy by verifying the information on which their thinking and that of others is based, and then assess that information for accuracy as well. They will demonstrate precision in their thinking by giving necessary details. Furthermore, the critically thinking learner will evaluate their thinking for relevance by ensuring that all the considerations they use in their thinking bear upon the question at hand. They will make sure they have not overlooked or failed to consider relevant information.

In their evaluation of depth in their thinking, the educator, the learner and others should ensure that they are dealing adequately with the complexities in the question under consideration, and simultaneously demonstrate breadth by ensuring that they take into consideration a variety of viewpoints.



Logic will be demonstrated by the learner by making evidence available and justifiable inferences when they reason through an issue. The educator and learners will use relevant intellectual standards when assessing reasoning within subjects and disciplines. The intellectual standards used to evaluate the critical thinking processes of the learners and reasoning behind their thoughts are clarity, relevance, depth, accuracy, specificity, consistency, logic, breadth, completeness, significance, adequacy, and fairness (Popil, 2011: 204-207).

a) Clarity

Clarity refers to the degree to which an argument, claim, or assumption is easier to understand, free from confusion or ambiguity or without obscurities (Eichhorn, 2008: 1-12). According to Popil (2011: 204-207), clarity is a fundamental perfection of thought, and clarification is a fundamental aim in critical thinking.

In facilitating the learners' critical thinking, the researchers will make sure that the learners understand that it is important that "they say what they mean and mean what they say". The key to clarification is to give concrete and specific examples.

Facione (2010: 1-28) assert that clarity is the gateway intellectual standard; that if a statement is unclear the educator will not be able to determine whether it is accurate or relevant. Clarity is important in nursing education because if information is not clear the learner will not be able to determine its accuracy and relevance to the issue at hand. The learner whose critical thinking is facilitated will be able to present information or express ideas about patients' health problems and intervention in a manner that will be understood by others, without leaving room for questions or misinterpretation. Clear information and questions will assist the learner in their daily decision-making and problem-solving when dealing with fellow learners and patients under their care.

b) Depth

Depth refers to the extent to which the answer addresses the complexities in a question, while accuracy involves the extent to which the explanation is free from errors or distortion. It is about the conformity with the fact or truth. It is concerned with how the learners deal with the complexities of the issue at hand (Eichhorn, 2008: 1-12; Facione, 2010:1-28). Depth is of importance in nursing education. A typical example is seen with the first-year learner who is taught mostly foundational knowledge on which content is scaffolded and becomes more complex as they advance to their fourth year of study. Scaffolding addresses the complexities of content from one level to the next.

The learner will be able to address the complexities of content or patients' health problems and answer questions that are raised, while avoiding oversimplification when relating information to the issue at hand, or content from one level to the other.

For example, at first-year level the learner is taught anatomy, while during the second year the content becomes more complex in that they are taught physiology, which they relate to the anatomy learned at level one, and proceed to relate normal physiology to patho-physiology as they learn conditions.

c) Logic

According to Robinson (2011: 275-287) the word 'logic' covers a range of related concerns, all bearing upon a question of rational justification and explanation. Logic refers to the extent to which an explanation, claim, or argument makes sense.

It is about the system of principles, concepts, and assumptions that underlie any discipline, activity, or practice (Eichhorn, 2008: 1-12). The concept of logic is a seminal notion in critical thinking.

The learner in this programme is expected to exhibit a reasoning process that is logical with conclusions that follow clearly from the issue at hand or the hypothesis formulated in their reasoning. For example, if the learner produces a diagnostic statement that reads as "Ineffective breathing pattern related to chest infection", they should be able to demonstrate logically how they came to this conclusion.

d) Completeness

Completeness of a logical system means that everything that should be derivable, is indeed derivable. It means that the system is strong enough to represent everything about entailment that we could possibly want. Completeness, which means that there are no true sentences in the system, and that at least in principle, is proved in the system. This means that if all the arguments are provable, then the logic is complete (Lai, 2011: 40-41). It is important that the learner whose critical thinking is facilitated, gathers information that is complete in order to form a basis from which they can make rational decisions about patients under their care.

e) Consistency

Consistency refers to thinking, acting, or speaking in agreement with what has already been thought, done or expressed. It means to have intellectual or moral integrity. Logical and moral consistency is fundamental to values of fair-minded critical thinking (Marin & Halpern, 2011: 1-13).

f) Relevance

Relevance implies a close relationship with, or such close natural connection as to be highly appropriate or fit. Relevant refers to bearing upon or relating to the matter at hand, it implies a close logical relationship with, and importance to the matter under consideration.

The ability to judge will enhance the learners' sensitivity to relevance, which develops by continuous practicing to distinguish relevant from irrelevant data, evaluating or judging relevance, arguing for and against the relevance of facts and considerations (Marin & Halpern, 2011: 1-13; Morrow, 2009: 278-287). The learners should, for example, know that a statement can be clear, accurate, and precise, but not relevant to the question at hand.

The implication is that the learner should be able to use their facilitated critical thinking to distinguish between relevant and irrelevant information, so as to make accurate and precise decisions about the issue at hand or the patient under their care. For example, the learner may collect a lot of information about a patient or fellow learner, but will have to assess the information for relevance before they make decisions or conclusions.

g) Breadth

Breadth refers to: Do we need to consider another point of view? Is there another way to look at this question? What would this look like from a conservative standpoint? What would this look like from the point of view of...? A line of reasoning may be clear, accurate, precise, relevant, and deep, but lack breadth (as in an argument from either the conservative or liberal standpoint that gets deeply into an issue, but only recognises the insights of one side of the question (Snyder & Snyder, 2008: 90-99).

After evaluating the information at hand, the learner whose critical thinking is facilitated should be able to give meaningful consideration to alternative points of view and interpretations, for instance, in deciding on a relevant intervention to solve the patient's problem.

h) Accuracy

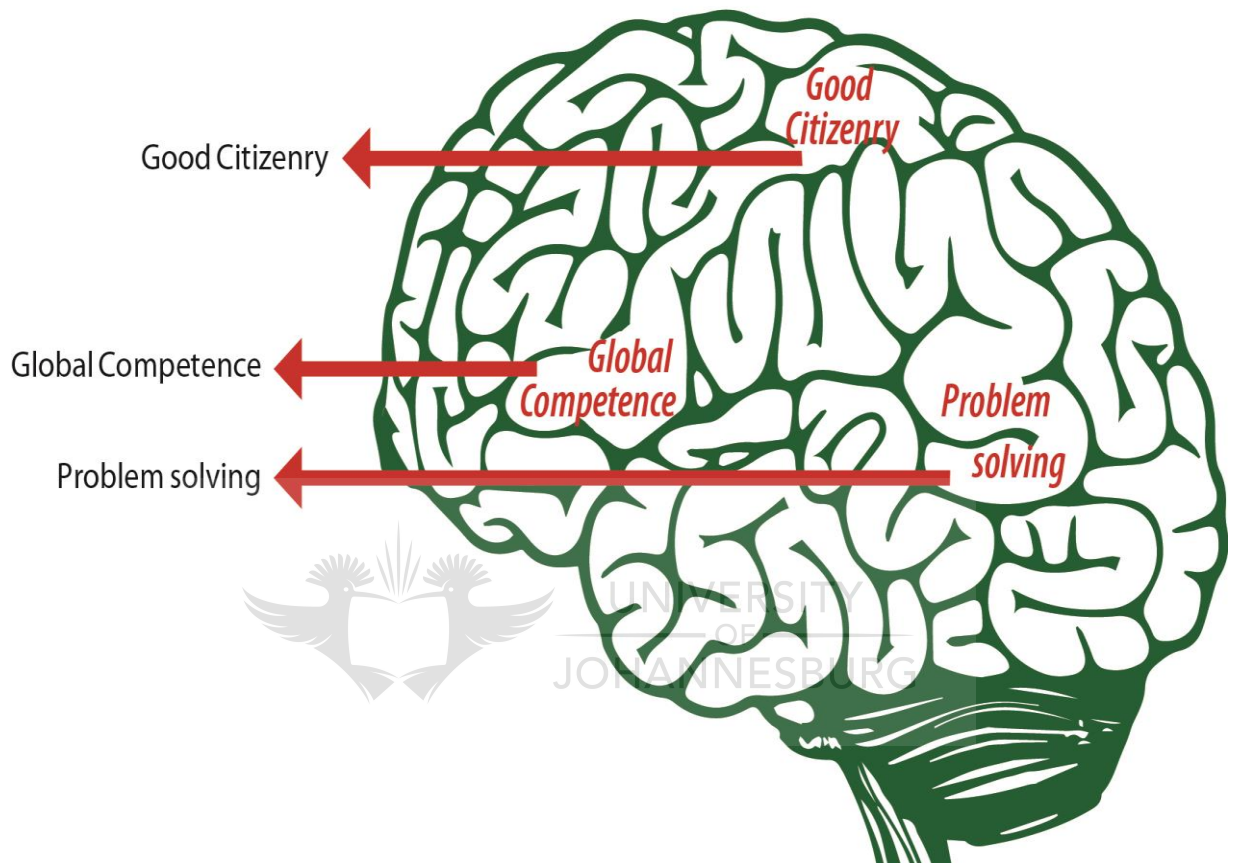
Accuracy means free from error, mistakes, or distortion. It implies a positive exercise of the learner to obtain conformity with fact or truth. Accuracy is an important goal in critical thinking, even though it is almost always a matter of degree (Snyder & Snyder, 2008: 90-99).

Accuracy is important in nursing education, as the learners deal with people's lives, and inaccurate information may lead to incorrect diagnosis of a patient's health problem and implementation of wrong interventions that may lead to complications and even the death of a patient. The learner should make statements of facts that are supported with evidence.



Figure 4.5

Outcome: Critical Thinker (Learner)



4.2.5 Outcome

The outcome of this programme is a critical thinker who will have problem solving skills, have global competence and exhibit good citizenry as depicted in Figure 4.5.

a) Problem-solving

Papastergiou (2009:1-12) believe that problem-solving is a cognitive process that searches for a solution for a given problem, or finds a path to reach a given goal. As a higher order cognitive process, problem-solving involves the use of other cognitive processes such as abstraction, decision-making, inference, analysis and synthesis on the basis of internal knowledge representation.

According to Isaaksen, Dorvak & Traffinger (2011: 19-23), problem-solving is a process of closing the gap between what is and what is desired. It is the act of answering questions, clearing up uncertainties, or explaining something that was not previously understood. Problem-solving generally involves devising ways to answer questions and to meet or satisfy a situation that presents a challenge.

Kumagai and Lypson (2009: 782-787) are of the opinion that problem-solving varies between learners, and is dependent on their mastery of a particular domain. It involves hypothesis testing, and pattern recognition by specific instances and by general prototypes. The learner will use pattern recognition or categorising in retrieving patterns from memory. The cognitive process of category assignment is usually based on matching an issue under discussion to a specific instance, or to a more abstract prototype.

The more difficult the problem, the higher the likelihood that the learner will use systematic generation or testing of hypotheses. As problem-solving involves the use of decision-making, the process includes diagnosis as opinion revision. Reaching a conclusion means that the learner will update opinion with imperfect information (evidence). The pre-test probability is the known prevalence or the learner's subjective impression of the probability of the problem before new information is acquired.

According to Kim, Park and Baek (2009: 800-810) the important aspect of solving a problem is to know what the real problem is, to plan how to solve it, and to evaluate whether the solution has solved the problem. The learner may decide to use general problem-solving and decision-making, which includes four steps, which are assessment, planning, implementation, and evaluation. During the assessment phase the learner will gather information about the problem. Based on the data at hand the learner will generate questions.

Their critical thinking may be illuminated by asking what, why, whom, and how. They will then formulate alternative statements about the problem and analyse them depending on the responses to the questions asked. They will also look at the problem from different viewpoints and opinions, and also use all senses by thinking the problem through, feeling it, and listening to it. The learner has to ensure they have enough information before they draw a conclusion. In the planning phase they will formulate objectives so that the expected outcome is clearly described. They may brainstorm the possible outcome and lastly draw a plan of action.

They will be logical in drawing the plan. In the implementation phase they continually reassess the previous steps, and determine whether the plan of action is effective. Finally, they will evaluate whether or not the problem has been solved. Throughout the steps they will also use their decision-making skills.

According to Croskerry (2009: 1022-1028) decision-making is differentiated from judgment in that it focuses on dissimilarity among alternatives including a justification process and involves more dimensional information processing. Decision-making is a problem-solving process that involves information acquisition and processing. The purpose of processing information in decision-making is to apply decision criteria that are used by the learner to evaluate alternatives. The learner does not rely on external information only, but also introduces new information to optimise their decisions.

On the other hand Brabham (2008: 75-90) are of the opinion that problem-solving is the action-end or implementation component of the overall critical thinking process. The process involves identifying the issues and facts in a problem or dilemma.

The learner will identify and explore causal factors, retrieve and assess the knowledge needed to appraise response options, and guide actions.

They will also compare the strengths and limitations of options. Following this, the learner will then implement the option that is mostly likely to resolve the problem, and will monitor the implementation and outcomes, and modify the strategy or action as needed. The process of problem-solving includes analysis of the problem aetiology, comparing of alternative approaches to resolving the problem, providing a rationale for the plan of action, and predicting the outcome. The learner will listen to reasoning as fellow learners talk through the problem and their approaches to analysing and solving the problem. They will also compare data searching steps, strategies implemented, and decisions made.

Papastergiou (2009:1-12) believe that problem-solving is a cognitive process that searches for a solution for a given problem, or finds a path to reach a given goal. As a higher order cognitive process, problem-solving involves the use of other cognitive processes such as abstraction, decision-making, inference, analysis and synthesis on the basis of internal knowledge representation. There are different approaches that the learner may use during problem-solving.

They may use the following:

- Direct facts – involves finding a direct solution based on known solutions.
- Heuristics – they may adopt a rule of thumb or the most possible solution.
- Analogy- involves reducing a new problem to an existing or similar one for which solutions have already been known.
- Algorithmic deduction – has to do with applying known and well defined solutions to a problem.
- Exhaustive search – the use of a systematic search for all solutions.
- Analysis and synthesis – involves reducing a given problem to a known category, and then finding a particular solution.

Furthermore Papastergiou (2009:1-12) assert that the learner whose critical thinking is facilitated may use problem-solving schemas, problem representation, abstraction, categorisation abilities, analysis, and synthesis to solve problems in the learning environment.

The learner may use Walla's process of problem-solving, which includes:

- Preparation – defining the problem and gathering information relevant to its solution.
- Incubation – critically thinking about the problem while engaged in other activities.
- Inspiration – having a sudden insight into the solution of the problem.
- Verification – checking to be certain that the solution of the problem is correct.

Alternatively they may use Poyla's process, which includes the following steps:

- Understanding the problem – identifying the problem's "knowns" and "unknowns".
- Devising a plan – this involves determining appropriate actions to take to solve the problem.
- Carrying out the problem – executing the actions that have been determined to solve the problem and evaluating their effectiveness.
- Looking backward – evaluating the overall effectiveness of the approach to the problem, with the intention of learning something about how similar problems may be solved in future.

According to Robinson and Hullinger (2008: 101-109), the learner will use problem-solving strategies that include hypothesis testing and pattern recognition by specific instances or general prototypes. Solving ill-defined problems will require the learner to make judgments and express personal opinions or beliefs about the problem. They will construct conceptual understanding of how the problem relates to domain-specific knowledge. At the same time, they will be required to make decisions. During decision-making they will elaborate on the nature of the detected problem, generate possible solutions, evaluate potential solutions, and formulate strategies for implementing them. The learner will choose the best possible option among several options, collect data, compare advantages and disadvantages of alternative approaches, and determine what additional information is needed to make the most effective judgment and be able to justify it.

b) Global competency

Global competency comprises the knowledge and skills that help others understand the world in which they live, the skills to integrate across disciplinary domains to comprehend global affairs and events, and the intellect to create possibilities to address them. Global competency also includes fostering an attitude that makes it possible to interact peacefully, respectfully, and productively with fellow human beings from diverse geographies. This involves three interdependent dimensions. First, there needs to be a positive disposition towards cultural differences and a framework of global values with which to engage these differences.

This calls for the learner to have a sense of identity and self-esteem but also empathy towards others with different identities. A globally competent learner will view cultural differences as opportunities for constructive, respectful, and peaceful transactions among other learners (Reimers, 2009: 24-27).

The learner as a member of a culture typically depends on the assumption that cultures are membership groups that are discrete, distinct from one another, and have boundaries that overlap roughly with the boundaries of countries. Thus, someone who grew up in a given country presumably is a member of that country's culture and, thus, has a cultural identity defined more or less in national terms. Through this programme and interactions, the learners will acquire the knowledge, ability, and predisposition to work effectively with people who define problems differently than they do. However through global competency the learners will through their facilitated critical thinking skills acquire an understanding of the global burden of disease, travel medicine, healthcare disparities between countries, immigrant health, primary care within diverse cultural settings and skills to better interface with different populations, cultures and healthcare systems (Mill, Astle, Ogilvie & Gastaldo, 2010: 1-11).

c) Good citizenry

On the other hand, good citizenry means that the learner who went through educational critical thinking programme will add value in the global village through various spheres, which call for special expertise, cultural knowledge and critical acumen in practice (Kalua, 2012: 1-5). The learner in a critical thinking programme will exhibit self-expressive values as well as the ability and desire to participate more directly in the decisions affecting their life (Dalton, 2008: 76-98). The critically thinking learner be will an active and reflective citizen and will promote active citizenship both within and outside the profession of nursing. A reflective citizenship ethos will assist the learner to overcoming problematic areas in practice. Therefore notion of good citizenry implies an explicit sense of professionalism. A hallmark of professionalism is the ability to balance the various responsibilities, to integrate practice and civil duties (Maak & Pless, 2006: 99-115).



Figure 4.6
Conceptual Framework to Facilitate Critical Thinking

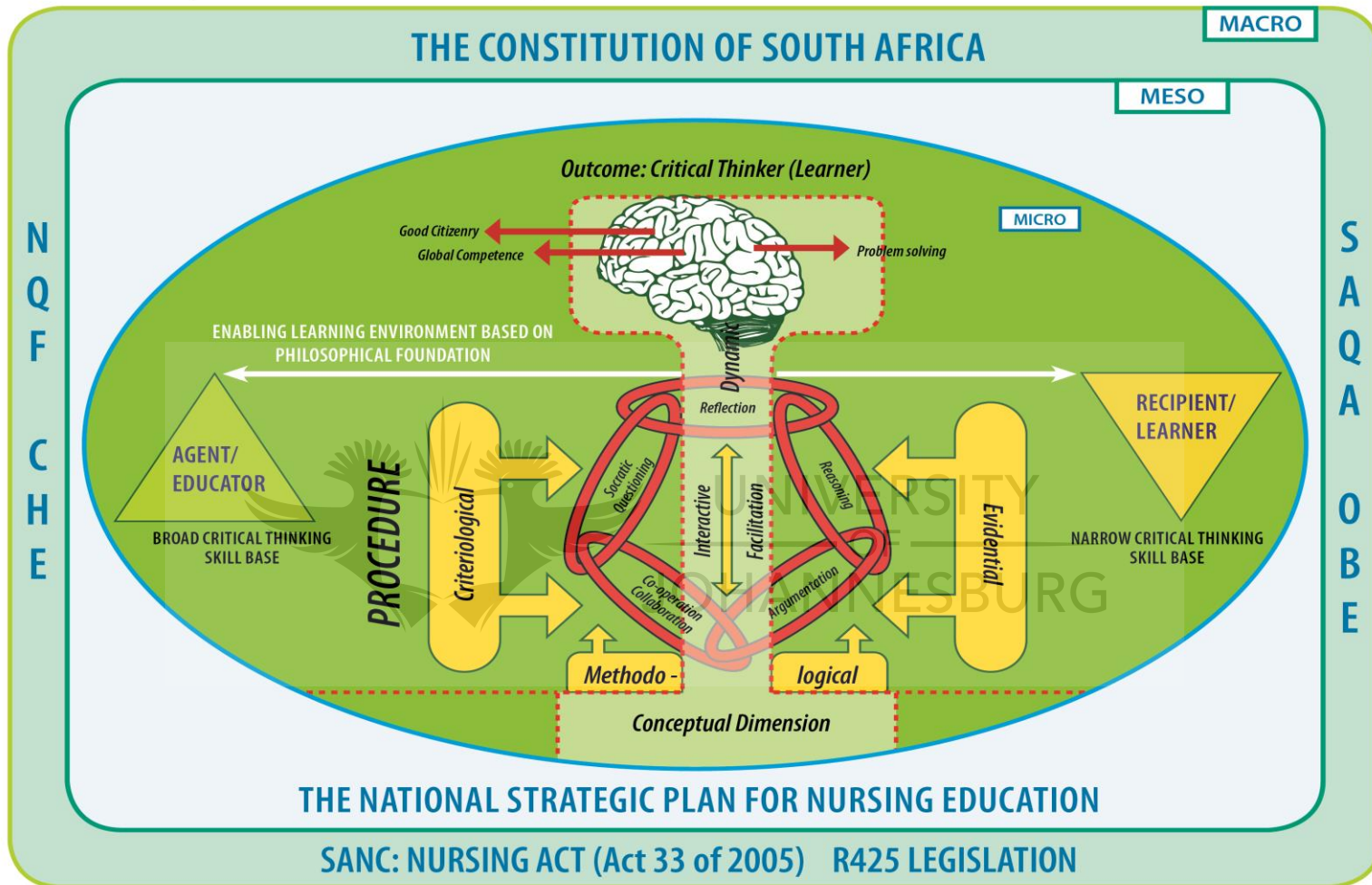


Figure 4.6 depicts a conceptual framework that was used to facilitate critical thinking. This conceptual framework consists of three levels which are the macro context made up of legal and professional frameworks that impacts on the programme to facilitate critical thinking. The second level is the meso level which consists of the national strategic plan for nursing education and practice which influences the programme and the lastly the micro context consisting of the philosophical foundations that underpins the facilitation of critical thinking. Furthermore there is in this level the educator and the learner who through interactive facilitation use the conceptual, methodological, evidential and criteriological dimensions to facilitate the learner's critical thinking skills within an enabling environment.

4.4 SUMMARY

This chapter focused on the conceptualisation of the findings based on critical thinking attributes such as conceptual, methodological, evidential, and criteriological aspects. Conceptual considerations consist of conceptual knowledge, interdisciplinary knowledge, and foundational and procedural knowledge, while methodological considerations are reflection, Socratic questioning/inquiry, deductive reasoning, inductive reasoning, hypothetico-deductive reasoning, dialectical dialogue, argument, problem-solving, decision-making, debate, and cooperative/collaborative interaction. Evidential considerations, which includes justification, investigation, and trail of evidence, were also conceptualised, and finally the criteriological considerations that involve clarity, depth, logic, completeness, consistency, relevance, breadth, accuracy and outcomes. The programme outcome is a graduate who will solve problems and make decision, is globally competent and display good citizenry. The programme is described in Chapter 5.

PROGRAMME TO FACILITATE CRITICAL THINKING

5.1 INTRODUCTION

Conceptualisation of critical thinking and the attributes that must be included in the programme was described in Chapter 4. This chapter focuses on the description of the programme to facilitate critical thinking. Critical thinking is a skill that is needed by all professionals in the workplace. This kind of thinking will enable the learner to solve complex problems in the learning area. The different steps in the programme are informed by the integrated framework for programme design. This framework is a result of integration of Beyer's (1988), Bevis' (1989), and Caffarella's (2002) frameworks for programme development. The integrated framework was described in Chapter 2 where the design and methods of the study were described. The first step of the integrated framework consists of the context, which is made up of the environment within which critical thinking takes place, the characteristics of the educator and the learner in critical thinking. The environment is divided into the macro, meso, and micro environments. The second step is the purpose of the programme, the third step is the structure of the programme, consisting of the philosophical foundations and programme learning outcomes, followed by the process to facilitate critical thinking. The procedure/process consists of the framework of critical thinking, derived from conceptual, methodological which includes the guidelines for each method and examples of teaching and assessment methods under each. Following is the evidential and criteriological dimensions of critical thinking (Facione, 1990). Lastly are the outcomes of the programme.

5.2 INTEGRATED FRAMEWORK OF THE PROGRAMME

The integrated framework of the programme consists of the contextual, purpose and rationale of the programme, structure of the programme, made out of the philosophical foundations, programme learning outcomes, procedure/process, evidential, criteriological dimensions and programme outcomes.

5.2.1 Contextual dimension

This programme takes place within the environment of the following legal and professional frameworks: Constitution of South Africa, Nursing Act (Act 33 of 2005), SANC Philosophy of 1993, R425, OBE, Act 58 of 1995 and the NQF (Act 67 of 2008), Higher Education Council and National Strategic Plan for Nursing Education. The legal and professional requirements for this programme are that the educator must:

- ensure that the learner produced by this programme is competent to independently practise comprehensive nursing care using their facilitated critical thinking skills to make meaningful decisions and solve problems,
- ensure that the learner produced is a practitioner with a caring ethos, a lifelong learner, and a critical thinker who is able to evaluate and assure quality in practice,
- enable the learner to use their facilitated critical thinking skills to apply culture congruent nursing care, diagnose patients'/clients' health problems, plan and implement therapeutic action and nursing care along the health/illness continuum and evaluation thereof,
- ensure that the teaching/learning process is learner-centred and that the learner is the focus of the learning activities,
- ensure that the learner demonstrates applied competence in an authentic context, while giving consideration to a range of possibilities for action, make considered decisions about which possibility to follow and perform the chosen action,
- ensure that the learner demonstrates an understanding of the context that underpins the action they take as they execute nursing care and integrate it into reflexive competence using their facilitated critical thinking skills,
- ensure the learner uses their facilitated critical thinking skills to integrate and connect performance and decision-making with understanding and with an ability to adapt and change to unforeseen circumstances,
- ensure that the learner is able to use creative and reflexive skills to make responsible decisions in cooperation with others in a team in a collaborative, dialectical, and dialogical manner while facilitating their critical thinking skills,

- ensure that the learner uses their facilitated critical thinking skills to collect, analyse, organise, and evaluate information while collaboratively and co-operatively communicating effectively with the multidisciplinary health team and fellow learners using visual, and language skills in a model of oral and written presentation,
- ensure that the learner is able, through their facilitated critical thinking skills, to use culture as a basis for language to provide a culture congruent and aesthetically sensitive care to patients and clients,
- ensure that the learner at this level demonstrates a well-rounded and systematic knowledge base in the learning area and a detailed interdisciplinary knowledge,
- ensure that the learner is able to use their facilitated critical thinking skills to demonstrate an informed understanding of nursing science terms, concepts, rules, principles, and theories,
- ensure that they use their facilitated critical thinking skills to effectively elect and apply essential clinical procedures, operations, and techniques, and have an understanding of the central method of inquiry in the learning area of nursing science and knowledge of interrelated disciplines' mode of inquiry,
- ensure that the learner is able, through their facilitated critical thinking skills, to deal with unfamiliar concrete and abstract problems using evidence-based solutions and theory driven arguments,
- ensure that the learners use their facilitated critical thinking skills to exhibit well developed information retrieval skills, critical analysis, synthesis, and presentation of information and opinions in a well-structured argument and
- ensure that the learner uses their facilitated critical thinking skills to demonstrate a capacity to operate in variable and unfamiliar learning contexts, and a capacity to use critical thinking skills to self-evaluate and address their own learning needs and interact effectively in a group (Act 58 of 1995).

5.2.2 Purpose and rationale for this programme

The purpose of this programme is to facilitate the critical thinking skills of the learners in an institution of higher education. The critical thinking skills acquired through this programme will enable the learners to make informed decisions and solve problems in practice.

5.2.3 Structure of the programme

PROGRAMME NAME: Programme to Facilitate Critical Thinking (Emergency Care Module).

NQF LEVEL : Level 5

CREDITS : 8

FIELD : NSB 9 Health Sciences and Social Services

5.2.3.1 Philosophical foundations

This programme is based on the constructivistic worldview. The constructivistic view is that knowledge should be constructed by the learners themselves. Therefore the learner is at the centre of the teaching/learning process and the educator should do the following:

- allow the learner to experience the world of nursing and use their facilitated critical thinking skills to attach personal meaning to learning,
- facilitate their critical thinking skills focus on the experience the learner brings into the learning environment,
- allow the learner to use their facilitated critical thinking skills to actively construct their own knowledge,
- scaffold the learner's critical thinking skills, and gradually relinquish the lead role as they become more adept at critical thinking,
- be a co-learner in the teaching and learning process,
- focus on assisted discovery as the learner's critical thinking skills are facilitated through interaction and
- proceed developmentally to facilitate the learner's critical thinking skills in order to bridge their zone of proximal development, while considering all the cognitive developmental factors of critical thinking.

Ensure that the internal learning environment is characterised by:

- democracy where all the learners are treated equally,
- sensitivity to cultural diversities characterised by culture accommodation and tolerance,
- co-operation and collaboration characterised by interdependence,
- interactive facilitation through encouraged dialectical dialogue and discourse;
- mutual trust and respect and
- active participation in the teaching/learning process without fear of ridicule or prejudice.

To effectively and interactively facilitate the learner's critical thinking skills the educator and learners in this programme are assumed to have the predisposition to:

- intellectual perseverance characterised by an internal drive to seek out the truth,
- intellectual humility that is characterised by a mutual acceptance and acknowledgement of the flaws in their thinking, and the limitations of their knowledge,
- intellectual empathy as exhibited by constantly seeing issues through the eyes of others and putting oneself in their place in order to understand their point of view,
- intellectual integrity demonstrated through a maintenance of a moral stance that confirms that they are not easily swayed by claims from others without due consideration,
- intellectual courage as demonstrated by a fearless spirit to pursue an issue at hand until they get to the bottom of things and
- have faith in reason, as exhibited by the confidence in their reasoning skills.

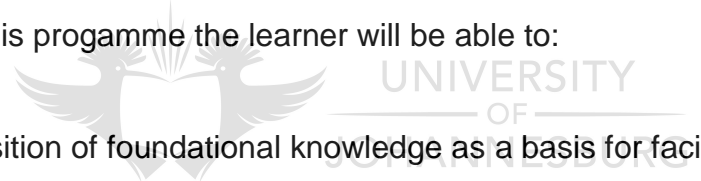
The educator and learners in this programme exhibit the following traits:

- Open and fair-mindedness that enables them to be responsive to and tolerant of conflicting views and differing opinions. They maintain an objectivity that allows them to be explicitly conscious of the beliefs they hold and recognise when the beliefs shape their experience.

- A willingness that involves a critical spirit to critically listen and read while respecting the right of others to hold a different opinion.
- Receptiveness and consideration of divergent viewpoints, and exercise fairness when making judgments, so as to overcome their egocentric tendencies.
- An inclination to monitor how they listen to others, so as to maximise the accuracy of their understanding of what is being said.
- Maintenance of an open mind while maintaining a “healthy” scepticism, and constantly adjusting the degree of their personal belief in relation to the quality of arguments and claims by others.
- An inclination to maintain curiosity and eagerness to acquire knowledge, even when the applications of their knowledge are not obvious.
- Confidence in their reasoning processes to make good judgments and have confidence in others to trust them as well.

5.2.3.2 Programme learning outcomes

At the end of this programme the learner will be able to:

- 
- Acquisition of foundational knowledge as a basis for facilitating critical thinking
 - the heart and the respiratory system.
 - Draw a concept map on the gaseous exchange during respiration
 - Demonstrate the ability to use reflection to construct new knowledge concerning clinical manifestations using their facilitated critical thinking skills in a burn patient due to smoke inhalation:
 - asphyxia; and
 - pulmonary oedema.
 - Demonstrate the use of Socratic questioning by exploration and analysis of the subjective and objective data in order to arrive at an appropriate nursing diagnosis.
 - Demonstrate the use of argumentation by debating the subjective and objective data in order to arrive at an appropriate nursing care plan.
 - Demonstrate the use of dialectic dialogic reasoning to facilitate critical thinking in ethical decision-making.

5.2.3.3 Procedure/ process

The process of facilitating critical thinking in this programme involves the use of the framework of critical thinking, which consists of conceptual, methodological, evidential, and criteriological dimensions of critical thinking. These are knowledge bases and teaching strategies that are used to facilitate the learners' critical thinking.

a) **Conceptual Dimension**

The conceptual dimension consists of foundational, interdisciplinary, procedural, and conceptual knowledge, which is used by the learners to reason about and interrogate information to form conceptual knowledge, which is higher knowledge achieved through the use of critical thinking skills.

➤ Foundational Knowledge

Foundational knowledge forms a basis for procedural and interdisciplinary knowledge, which, when combined, will form a precursor for building conceptual knowledge.

Therefore the educator should:

- Take prior knowledge, beliefs and experience into consideration as it forms part of foundational knowledge.
- Ensure that the learner has domain-specific knowledge and an understanding of basic facts, ideas, perspectives and general principles.

For example, for a learner to understand a condition of the respiratory system they will need foundational knowledge of anatomy and physiology of the respiratory system, and the concepts use in the respiratory system, such as residual air and dead space.

- Ensure that the learner has propositional beliefs concerning the meaning and descriptions of relevant concepts and relationships between them, for example the relationship between the concepts of cardiac cycle and cardiac output.

- Ensure that the content has logical meaning and is related to the learners' cognitive structure in a sensible manner, as the learner's cognitive structure provides an anchor for integration of knowledge from different disciplines.

➤ *Interdisciplinary Knowledge*

Interdisciplinary knowledge is knowledge borrowed from other sciences other than nursing science. It is knowledge integrated within other domains, for example physiology, biology, physical science, microbiology and pharmacology.

Interdisciplinary knowledge enables the learner to use their preconception of "what is" and the framework by which they arrive at conclusions. To use this knowledge to facilitate the critical thinking skills of the learners the following should be done:

- encourage the application and integration of interdisciplinary knowledge into the construction of conceptual knowledge during the use of the skill of explanation of reasoning and points of view,
- encourage the use of interdisciplinary knowledge to enhance the cognitive process of data interpretation, which includes categorisation, decoding significance, and clarifying meaning,
- encourage the use of interdisciplinary knowledge to emphasise critical thinking skills such as analysing, application, generalising, and seeking meaningful connections between nursing science and other related sciences,
- encourage the use of interdisciplinary knowledge to shift the learners' focus from memorisation of facts to focus on a central theme, the application of knowledge relative to the theme, and reflection on their facilitated critical thinking skills,
- encourage the learner to use their facilitated critical thinking skills to obtain higher level beliefs about the source, certainty and organisation of knowledge (epistemological beliefs) to better prepare them to deal with complex knowledge domains that lack structure, that will enable the learner to construct personal knowledge with emphasis on coping with difficult tasks, and the ability to search for multiple solutions, focus on the evolving connections among emerging ideas, interpretation, and application of the new-found knowledge across domains,

- refer continually to the integration of interdisciplinary knowledge in their reasoning about information at hand, to facilitate the cognitive organisation of knowledge structures into frameworks of all related perspectives, ideas, concepts and methods on inquiry making up the knowledge domain and giving it meaning, called “schemas”, “mental models” or “conceptual frameworks,”
- encourage the learner to refer to interdisciplinary knowledge to synthesise or balance multiple perspectives from multiple disciplines to produce a deeper understanding, a fair judgment, or a viable solution that will accommodate different perspectives,
- ensure that the use of interdisciplinary knowledge leads to the construction of new cognitive associations and the modification of existing ones as new ideas and concepts that are applied and integrated into the learners’ existing cognitive representation of the world, by using the critical thinking skills of explanation, inference, justification, hypotheses formation and speculation.
- encourage the use of interdisciplinary knowledge so that the learner is enabled to extend their existing knowledge to identify original relationships and unusual connections among unrelated things, which allows them to transfer knowledge in the form of schemas or rules from one domain to another as they begin to acquire the skill of recognising cues, and using the critical thinking skills of inferencing, analogising, summarising, and generalising within and across domains.

➤ Procedural Knowledge

Procedural knowledge involves the “how” of things and is used in processes and procedures. It involves knowledge, enabling skills, affective/behavioural processes, and operations. Procedural knowledge is exercised in the performance of a task. It follows the steps in order of priority from lower to higher order namely, imitation, manipulation, precision, articulation, and naturalisation.

Imitation

Imitation refers to mimicking or reproduction of an action and the educator should:

- ensure that the learners observe the educator or a more able peer apply their psychomotor skills and procedural knowledge to perform a task, for example observe an educator demonstrate how to auscultate a patient's chest,
- through guided practice, support the learners by suggesting strategies to learn to think critically, and help to identify the critical thinking skills used by the educator;
- initiate ideas to facilitate the learners' critical thinking skills and
- allow the learner to engage in trial and error until the appropriate response is achieved.

Manipulation

Refers to the reproduction of an action or procedure from instruction or memory. The educator should:

- Encourage the learner to use their procedural and psychomotor skills to carry out a task from a written or verbal instruction.
- Allow them to practise the particular skill or sequence until it becomes habitual and they can perform the action with some confidence or proficiency.
- Allow the learners to break the action into manageable steps while applying their procedural knowledge to each step and explaining the rationale behind each.

Precision

- assess how accurate, correct, and meticulous the learner performs the task; and
- allow the learner time to practise skill until they are able to perform it without assistance.

Articulation

- allow the learner to adapt and integrate their expertise to satisfy a non-standard objective, and

- encourage them to relate and combine associated activities to develop methods to meet various requirements.

Naturalisation

- Encourage learners to create their own actions or modify the learned psychomotor skills and develop them from being a novice to being an expert.
- As they retrieve information during the use of procedural knowledge, encourage the learners to identify their own misconceptions.
- Encourage the use of varied examples and opportunities to practise through their facilitated critical thinking skills, while applying principles or strategies within a domain.
- Use self-talk and imagery in different stages during the application of psychomotor skills.
- Encourage the learner to analyse behaviour, subject matter, and information processing.
 - o behaviour analysis requires the learner to identify specific behaviours necessary to perform a complex task,
 - o subject matter analysis involves breaking down a task into specific topics, concepts, and principles; and
 - o information processing analysis involves identifying the cognitive processes involved in a task.
- Independent and autonomous performance of a task.

➤ *Conceptual Knowledge*

Conceptual knowledge refers to domain-specific knowledge that the learner constructs using their acquired foundational, interdisciplinary, and procedural knowledge. It is knowledge that consists of concepts, definitions, statements, categories, principles, and theories.

Concepts

A concept is a term that abstractly describes and names an object, a phenomenon, or an idea, thus providing it with a separate identity. At a higher level of abstraction found in conceptual models, concepts have general meanings and are referred to as constructs (Burns & Grove, 2009: 126). To enable the learner to form concepts:

- Encourage generalisation from personal experience, impressions, theories, and other knowledge.
- Encourage deep conception and firm anchoring in the learners' cognitive structure that will enable them to use comprehension and abstraction with critical judgment and evaluation.
- Facilitate the formation of concepts through the process of mentally isolating a group of concrete and distinct perceptual units on the basis of observed similarities, which distinguish them from other known concepts.
- Encourage the learner to retrieve the stored concepts by using their facilitated critical thinking skills to reason, identify similarities and differences, abstract the information into concepts, draw inferences, and reach conclusions.
- For the learner to understand a concept, encourage them to compose functions, evaluate the function at a point or representations of the concept in order to develop a mental picture, properties, and processes associated with the concept.
- Urge the learners to use concepts as instruments to identify, supplement, and place an object or issue in a system.
- Ensure the learner uses concepts to create meaning that is general and applicable in a variety of instances, despite their differences that are constant, identical, or uniform in what they refer to, and that are standardised known points of reference by which they gain understanding and knowledge construction when they are faced with uncertainty and lack of knowledge.
- Encourage the use of conceptual knowledge to evidence the more important concepts and possibly those of lesser importance in assessing and analysing a problem under discussion.
- Encourage the learner to use conceptual knowledge to demonstrate the relationship between concepts.

- Stimulate learners to analyse the network that constitutes the conceptual core of a topic, in order to make inferences at a later stage.
- Encourage the learners to use concepts to strengthen their understanding of texts, arguments, points of view, and influence the creation of meaningful conceptual knowledge and the explanation of facts.
- Encourage the learner to use their facilitated critical thinking skills to move up the conceptual hierarchy, from the facts to the theories that tie the concepts together, and to the model that integrates the strands of the explanatory theory into a coherent system.

Definitions

According to De Vos et al (2011: 33) definitions are used to facilitate communication and argument to the extent that they make it possible to say something more easily and clearly than would otherwise be possible.

To enable the learner to formulate correct definitions:

- ensure that the learners observe the rules of formulating definitions,
- ensure that the learners use definitions to understand concepts as they provide a basis for and facilitate comprehension of important explanations in general and of phenomena, facilitate problem-solving, and create dialogue between the educator and learners,
- encourage the use of theoretical definitions to bring focus to the relationship between a given concept and related concepts within a specific conceptual framework (model or theory),
- encourage the learner to use operational definitions to present specific conditions and the appropriate use of a specific concept, and conditions that state that the execution of certain operations will result in specific results and
- ensure that the learner uses definitions to identify and retain concepts and establish relationships, the hierarchy, and integrate knowledge.

Relational Statements

Relational statements declare that a relationship or link of some kind (positive or negative) exists between two or more concepts. Relational statements are also called propositions (Burns & Grove, 2009: 718).

- Ensure that the learners, through their facilitated critical thinking skills use relational statements to describe the direction, shape, strength, symmetry, sequencing, probability of occurrence, necessity and sufficiency of a relationship between concepts.

Categories

According to Strauss and Corbin in Creswell (2013: 86), a category represents a unit of information composed of events, happenings, and instances.

- encourage identification, differentiation, and understanding of ideas and arguments to enable the cognitive process of categorisation,
- use conceptual categorisation to enable the learner to use the critical thinking skill of inference and
- use categorisation to enable the learner to generalise as they apply their knowledge about an item to a category.

Principles

- encourage the use of principles to judge facts, analyse arguments and explain issues.

Theories

A theory is an integrated set of defined concepts, existence statements, and relational statements that can be used to describe, explain, predict, or control that phenomenon (Burn & Grove, 2009: 139).

- ensure that the learner uses theories to understand, explain, and make predictions about specific subject matter and
- encourage them to use theories to make clear, consistent predictions, summarise and organise information.

Conceptual knowledge is formed by concepts, definitions, relational statements, categories, principles, theories, and systems that are stored in memory and retrieved during critical thinking. It is used to interpret, draw inferences, evaluate, and explain their reasoning coupled with understanding the reasoning of fellow learners.

b) Methodological Dimension

The core methods to facilitate critical thinking in this programme is reflection, Socratic questioning or inquiry, argumentation, co-operative/collaborative learning. These methodologies use the cognitive skills of reasoning such as inductive, deductive, hypothetico-deductive reasoning and dialectic dialogic reason, inferences, and problem-solving.

- Reflection



Reflection is a means to develop critical thinking. The reflective process is used as a method to facilitate the learner's critical thinking skills. It involves a continuous effort to evaluate and interpret experiences and issues in a quest to make meaning. It allows the learner to make judgments in complex and ambiguous practice instances. Reflective thinking focuses on the process of making judgments about what has happened. Reflection provides the learner with an opportunity to step back and think about how they actually solve problems and how a particular set of problem-solving strategies is appropriated for achieving their goal. According to Chabeli's model (2001), the process of reflection consists of three phases, namely awareness and disequilibrium, an interactive constructing process, and consolidation for decision-making and problem-solving, and the use of reflection to facilitate critical thinking is described according to these phases in this programme.

According to Dewey (1998: 4) reflection involves a consecutive ordering of ideas in such a way that each determines the next as its proper outcome, while each outcome in turn leans on or refers to its predecessor. It is an active, persistent, careful consideration of a belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion which it tends (Dewey, 1998: 9). Reflection begins with a state of doubt, hesitation, or perplexity, and moves through the act of searching to find material that will resolve, clarify, or otherwise address the doubt. This may include past experience or relevant knowledge. Reflection involves an assessment of how and why the learner has perceived, thought, felt, and acted.

The learner cognitively captures an experience, thinks about it, mulls over it, and evaluates it. The learners engage in intellectual and affective activities to explore their experiences in order to construct new knowledge, and to come to new understanding and appreciation (Lampert & Graziani, 2009: 491-509).

The reflective process requires certain attitudinal dispositions. These attitudes are necessary as they will create a desire and the will in the learner to employ their reflective skills. The attitudes necessary are described below (Chabeli, 2001: 84-91; Lampert & Graziani, 2009: 491-509)

- the learner should be without prejudice,
- display an active desire to listen to more than one side of an issue,
- give heed to facts from whatever source,
- give full attention to alternative possibilities,
- exhibit wholeheartedness, which includes thorough interest, sincerity, and single-mindedness in consideration of issues,
- show genuine enthusiasm about the issue at hand,
- willingness to adopt consequences when they follow reasonably from any point of view,
- responsibility in facing consequences of a projected step, which secures integrity, consistency, and harmony in beliefs,
- tolerance of diversity, disagreement, and uncertainty,
- openness to new ideas,

- honesty and a confrontational attitude with self,
- self-awareness,
- bracket prior judgment and harness biases and
- readiness to engage in reflection.

The context during reflection should be one that affords the learner to take their time to think through issues without feeling that they are being coerced or manipulated into reaching the conclusion. It is important that the context provides emotional and psychological safety for the learner to engage in reflection.

- the context should make allowance for enough wait-time to allow the learners to reflect,
- create an enabling environment and psychological space for the learners to reflect when responding to enquiries,
- provide an emotionally supportive learning environment,
- ensure that the learning environment encourages re-evaluation of conclusions,
- the learning environment should be conducive to authentic tasks that include ill-structured data that encourages reflection and
- create a less-structured learning environment that prompts learners to explore what they think is important at a given time.

Guidelines to facilitate reflection include:

Cognitive awareness and disequilibrium which refers to the learner's perception of an identification of a knowledge gap, or a need to bridge the gap, or solve a problem. To create this awareness and disequilibrium, the educator follows the guidelines described below (Chabeli, 2001: 84-91):

- trigger in the learner's mind the process of reflection through questioning or activities that initiate a cognitive situation of dissonance, perplexity, and discomfort,
- create an awareness of gaps in their cognitive knowledge structures,
- awaken in the learners' minds a perception of a need or a problem that they have to solve through exploration of relevant knowledge,

- create in their minds a need to resolve the cognitive dissonance,
- ensure that reflective activities are contextualised, appropriate, and meaningful,
- the learner should consider the context in which the judgment is to be made,
- encourage the learner to cognitively identify theoretical constructs to understand the problem at hand (constructs are from foundational, procedural, and interdisciplinary knowledge) and
- create a sense of wonder in the learners' minds to inspire their imagination towards wanting to go deeper into issues.

Examples of teaching strategies to create awareness and disequilibrium

To create awareness and disequilibrium in the learners' minds, the educator uses the teaching strategies listed below.

- Questioning: self-questioning or peer-questioning

The educator may instruct the learners to question themselves in relation to an experience that they have been asked to reflect on and respond to in writing. The learner may ask themselves the following questions.

- What is my belief/standpoint?
- What knowledge do I have to answer this question or to undertake this task?
- What knowledge gaps do I have to address this problem?
- How and where can I obtain the knowledge I lack?

- Narratives about a clinical experience

The learners may be instructed to tell or write a story about a clinical experience they were exposed to. What was it, what happened, how did they deal with it, is there a different way in which they could have dealt with it or is there a way they can make it better next time they encounter the experience (Denzin & Lincoln, 2011: 348).

Examples of assessment strategies during this phase

To assess the learners the assessment strategies below are used.

- Self-assessment

The learners can self-assess to determine what they are capable of in relation to the learning content, identify gaps in their knowledge, and identify strengths and weaknesses. They also assess what they need to do to improve and where to get the necessary knowledge.

- Direct observation

Direct observation has been proposed as a useful tool for prior learning assessment. This refers to the observation of the skills in practice, watching a learner and learning from the experience. These can be simple checklists or be more detailed (requiring subjective responses).

- *Interactive Constructive Process*



The interactive constructive process involves dialectical dialogic interactive construction, evaluation, and the synthesis of knowledge. To get the learner to engage in this interactive construction of knowledge requires the educator to institute the guidelines described below (; Fook et al. 2011: 1-18; Pisapia et al. 2008: 1-27).

- learners enter into an interactive process of evaluating perspectives and assumptions within a specific context.
- allow and encourage an interactive dialectic dialogue for learners to reconstruct and reorganise knowledge.
- encourage the learners to challenge the perceptions that emerge during the interactive dialogue.
- ask learners questions beyond the foundational and conceptual knowledge to broaden their perspective and reframe thoughts and insights.
- Learners identify ideas about the problem at hand.

- Through enquiry learners are encouraged to detect arguments, analyse emerging cues, and to attach meaning.
- As the learners interact through dialectical dialogue, monitor the inquiry process.
- Direct the learner towards individually generating new cues and ideas, and collectively through dialogic interaction.
- Encourage independence without relinquishing the mediatory role of the educator.
- Guide the learners to form mental models, draw analogies, and sort out ideas using their intellectual tools.
- Encourage appraisal of ideas that are generated by the questions asked.
- To examine ideas, direct the learners to search for and access frames of reference through self-questioning and dialogue.
- Guide the learners to identify prototypes and formulate preliminary hypotheses from general or specific systems or patterns of past experiences.
- The learners identify conceptual relationships between emerging ideas to distinguish likeness and distinction.
- Encourage the learners to suspend judgment.
- Direct learners' thinking towards making interdisciplinary associations between ideas.
- Encourage learners to assess claims and arguments.

Examples of questions that may be asked:

- "Are we clear about what we are evaluating?"
- "Are we clear about our purpose?"
- "Given our purpose what are the relevant criteria or standards of evaluation?"
- Ensure that the learners appraise the accuracy of the information at hand by assessing credibility, contextual relevance, acceptability, and ascertain authenticity and validity before interpreting it.
- Encourage the learners to cognitively categorise, decode significance, clarify meaning, consider alternatives, sort and classify information.
- Encourage learners to give their own concept in order to place issues within the context of their experience, point of view, perspective, or philosophy and related disciplines.
- Be aware of biases, conclusional mistakes, and misconceptions that can lead to the formulation of incorrect hypotheses with subsequent conclusions being drawn.

Examples of teaching strategies to use in the interactive process of construction of knowledge

During this phase the educator can use the following teaching strategies to facilitate the interactive construction of knowledge among the learners:

- Peer tutoring.

Assign content to one learner to prepare and to come to class and teach others. The task must initially be simple. Encourage the learners to explore and clarify ideas, solve problems, generate hypotheses, and discuss questions throughout the tutoring session (Bruce et al. 2011: 159; Miller, Topping & Thurston, 2010: 417-433;).

- Reflective journal writing

Instruct the learners to keep a reflective journal in which they make entries based on their clinical experiences. The learners should be free to include descriptions of emotional reactions and cathartic reflections. Encourage the learners to look at associations as they make entries, integrate, and appropriate knowledge. Allow time for critical appraisal of the journal entries and peer group discussion. Encourage sharing of questions, brainstorming, dialogue, and discourse. Encourage self-awareness and self-evaluation (Epstein, Siegel & Silberman, 2008: 5-13).

- Concept mapping

Instruct the learners to write down a graphic representation of the signs and symptoms of a particular condition, for example asthma, and proceed to the causes, diagnostic measures, and treatment. Thereafter, the learner may present their concept maps to the class and discuss them (Hay & Kinchin, 2008: 167-182).

- Seminars

The learner can prepare a theme to present to the whole class. Define the theme and the learning outcomes related to it. Give the learners a structured framework of what is expected of the learners (Bruce et al, 2011: 127, 314).

Examples of assessment strategies

Assessment strategies that may be used are:

- Critical incident technique

The learners are requested to write down what they did in a particular clinical situation, after assessing the worth or significance of their action (Johnson, 2012:1).

- Portfolio assessment

The learners' collection of work and records gathered over a period of time in diverse contexts is selected and presented for assessment. Portfolios are a collection of evidence to demonstrate skills, knowledge, attitudes, and achievements. They rely on a level of self-regulation, writing, and critical reflection skills on the part of the individual being assessed (Chabeli, 2001: 84-91).

- Peer-assessment

Learners are assessed by others using predetermined criteria that is explicit and understood by the learners. The end of this phase leads to the last phase which is consolidation and decision-making as described below.

➤ *Consolidation and Decision-making Phase*

This phase involves consolidation and integration of the newly constructed knowledge into the learner's existing cognitive structures and knowledge frameworks. The educator should consider the guidelines described below to facilitate reflection in this phase (Chabeli, 2001: 84-91):

- encourage the learners to self-examine and self-correct,
- the learners should reflect on their individual reasoning and verify the results produced and the correct application and execution of the mental activities involved,
- encourage the learner to make an objective and thoughtful meta-cognitive self-assessment of their own opinions and the reasons for holding them,
- the learner judges the extent to which their thinking is influenced by deficiencies in their knowledge, or by stereotypes, prejudices, emotions or any factors which constrain their objectivity or rationality,
- guide the learners towards reflecting on their motivations, values, attitudes, and interests with a view to determining that they have endeavoured to be unbiased, fair-minded, thorough, objective, respectful of the truth, and rational in coming to their analyses, interpretations, and inferences,
- encourage the learners to examine their views on a controversial issue with sensitivity to the possible influences of their personal bias or self-interest,
- learners to review their own methodology regarding detecting mistaken applications,
- identify and review their reasons and reasoning processes in coming to a particular decision,
- guide them to examine judgments for relevance and appropriateness,
- direct the learners towards consolidation of the discovered new knowledge and to revisit the experience in order to apply the new-found knowledge with an increased awareness and
- guide them towards making a decision.

Examples of teaching strategies to use during the consolidation for rational decision-making and problem-solving are:

- Value clarification

The learners are taken through the valuing process using Rath's value clarification process so as to assist them to expand their skill in recognising their personal and professional values when they make clinical decisions and solve problems (Bruce et al. 2011: 177).

- Research projects

The learners are given a topic to research which they will present later to the class.

- Clinical conference

The learners may choose a team leader from their learning group and prepare a selected disease. They will gather enough information, formulate statements of relationships in the information, and present in a clinical conference, which will include their peers, the educator, and other members of the multidisciplinary health team (Bruce et al. 2011: 155).

Examples of assessment strategies

Assessment strategies that are used in this phase are:

- Research paper presentation and critique

The learners present their research paper while the others listen and critique. The learner audience judges the value and usefulness of the study (Burns & Grove, 2009: 609).

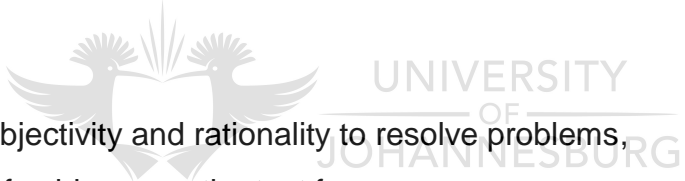
- Comprehensive performance task assessment and evaluation.

The educator assesses the tasks that focus on the learners' application of knowledge, skills, attitudes, and values in a variety of realistic clinical situations and contexts.

The tasks can be ill-structured so as to encourage rational decision-making and problem-solving (Levett-Jones, Gersbach, Arthur & Roche, 2011: 64-69). During the interactive construction phase, reflection is used as the basis for facilitating the learners' critical thinking skills with the integration of Socratic inquiry, argumentation, inductive reasoning, deductive reasoning, hypothetico-deductive reasoning, and dialectic dialogue reasoning as the learners reason out issues.

- **Socratic questioning/inquiry**

Socratic questioning or inquiry refers to the kind of questioning in which the original question is responded to as though it was an answer. It is a type of questioning that deeply probes or explores the meaning, justification or logical strength of a claim, and position or line of reasoning. Questions that are asked investigate assumptions, viewpoints, consequences, and evidence (Brookfield, 2011: 92-9; Paul & Elder, 2008: 34-35). The attitudes necessary for successful Socratic questioning and that which the educator and the learners should exhibit are the following (Brookfield, 2011: 92-9; Paul & Elder, 2008: 34-35):

- 
- valuing objectivity and rationality to resolve problems,
 - respect of evidence as the test for accuracy,
 - a willingness to suspend judgment,
 - tolerance for ambiguity and
 - an exhibition of a healthy skepticism, curiosity, and respect for the use of reason.

The context that facilitates questioning should be one that allows for mutual respect. The environment should be conducive to freedom of expression and allow for independent and critical thinking (Brookfield, 2011: 92-96; Paul & Elder, 2008: 34-35).

- there must be mutual respect among the learners,
- allow freedom of expression without prejudice or bias,
- the learning environment should adhere to principles of democracy where everyone is treated equally,
- there must be cultural tolerance and accommodation,

- the environment should be one that encourages dialogue,
- allow for enough wait time,
- create an enabling environment and space for the learners to reflect when responding to inquiries,
- create a less structured learning environment that prompts the learners to explore what they consider important and
- the learning environment should be emotionally supportive.

Guidelines in Socratic questioning

The educator needs to consider the following guidelines when using Socratic questioning as a method of facilitating critical thinking (AECT Trainer's Toolkit, 2008: 1-15; Billings & Halstead, 2012: 274-275; Hughes et al. 2013: 165; Paul & Elder, 2008: 34-35).

- Encourage the learners to adhere to a subsidiary question until it is answered.
- Avoid coercion and manipulation.
- Create an open and trusting classroom environment.
- Guide and gently nudge the learner to examine the issues they take for granted, such as assumptions, beliefs, experiences, and paradigms.
- Allow sufficient time to construct meaningful and thought-provoking questions.
- Be prepared to facilitate the discussion that should follow a good question period.
- Respond to all answers with a further question. It should develop their fuller thinking and depth of thinking.
- Where possible, seek to understand the ultimate foundations of what is said or believed, and follow the implication of those foundations through further questions.
- Treat all assertions as in need of development and connecting points to further thoughts.
- Recognise that any thought can exist fully in a network of connected thoughts.
- Stimulate the learners through questioning to pursue those connections
- Give pre-class assignments that will lead to adequate learner preparation.
- Ask "why" questions that require explanation of principles, and help to determine the amount, direction, and quality of the learner's thinking.

- Formulate questions that facilitate an attitude of critical inquiry.
- Assist the learner to form relationships, induce involvement, and enhance the learner's critical thinking through questioning.
- Questioning should be used spontaneously as an exploratory strategy or with issue specific content.
- Design questions to assess various cognitive skills and sub-skills associated with critical thinking.
- Monitor the learner's verbal and non-verbal responses as well as the flow of questioning.
- Stimulate mental alertness and encourage co-operative questioning through questions generated by the learner.
- Pose questions to create an awareness of a point of view in the learners' minds that they may have overlooked, to further create doubt; the objective is that they test their proposition anew.
- Ensure that the learners are clear about what is being said, by testing it against their individual experiences and asking clarity seeking questions in order to establish a reference to experience and to avoid judgment of too general a nature.
- Encourage intellectual perseverance in the face of difficulty, but on the other hand display intellectual humility to accept temporarily that their thinking and dialogue may take a different course.
- Encourage the learners to maintain honesty and fairness in examining the thoughts of others and their own thoughts.
- Tolerate learner silence.
- Encourage the adoption of justified positions, mutual respect, and formulation of own thoughts as an answer to a question.
- Restrain oneself from providing answers by allowing the learners to discover insights on their own.
- Allow the learners to independently seek information, formulate and formulate criteria to clarify issues/arguments for assessment and making judgments.
- Raise questions that are investigative in nature.
- Raise questions of a fundamental nature:
 - questions about the significance of basic elements of a subject; and
 - questions seeking explanations of basic patterns - what is causality.

- Encourage the learner to express their thoughts clearly to be understood by others, and to grasp the thoughts of others. Insist on precise and shared understanding.
- The act of directing the thinking of the learner should never encroach on the learner's emerging judgment.

Examples of Socratic questions

Questions that seeks clarity:

- What do you mean?
- How does ... relate to...?
- What do you think is the main issue here?
- Thando, can you summarise in your own words what Siphso said?

Questions that probe assumptions:

- What are you assuming?
- You seem to be assuming... Do I understand you correctly?
- Why do you think the assumption hold here?
- All your reasoning depends on the idea that... Why have you based your reasoning on ... instead of...?

Questions that probe reasons and evidence:

- What would be an example?
- How do you know?
- Do you have any evidence for that?
- What difference does that make?
- Is there reason to doubt that evidence?

Questions about viewpoint or perspectives:

- What are you implying by that?
- What effect would that have?

- Would that necessarily happen or only possibly/probably happen?
- If ... and ... are the case, then what might also be true?

Questions that probe implications and consequences:

- How can we find out?
- How would you state the issue?
- What generalisations can you make?
- What are the consequences of that assumption?

Questions about questions:

- How could someone settle this question?
- Is this question clear? Do we understand it?
- To answer this question what other questions must we answer first?
- What does this question assume?

Examples of teaching strategies that may be used in Socratic inquiry

- Clinical conference

Clinical conference is a conference held by people who are involved in giving health care services (Bruce et al. 2011: 152). This is used as a platform for sharing interdisciplinary knowledge. It is aimed at benefitting the client and the learner (Billings & Halstead, 2012:324-326).

- Questioning

Appropriate questioning strategies are used to ask the learners thoughtful questions that compel them to think critically.

- Nursing process or case studies

The learners are given a particular health problem that they need to research as a case study and apply the steps of the nursing process to resolve it. They may be used to enable learners to demonstrate skills learned in professional contexts to other settings. This involves requiring them to provide recommendations or solutions, or to write their own case studies based on their own experiences (DeBourgh, 2008: 76-87).

Examples of assessment strategies in Socratic inquiry

- Comprehensive patient assessment

The learners are given a focused assessment on their ability to apply their facilitated critical thinking skills, and related attitudes and values in a variety of learning environments. The learners may work in small groups, depending on the complexity of the task at hand (Levett-Jones et al., 2011: 64-69).

- **Argumentation**



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The context of argument requires that the learner should have certain attitudinal traits. Argumentation involves a process of reason-giving in communicative situations for the purpose of justification of acts, beliefs, attitudes, and values. It includes putting forward a set of claims in an attempt to demonstrate that some further claims are rationally acceptable. The learner in this programme needs to have the following attitudes (Freely & Steinberg, 2009: 5).

- inquisitiveness- an inclination to pry,
- open-mindedness and receptivity to divergent worldviews,
- an inclination to consider alternatives and understand the opinions of others,
- objectivity in that the learner is explicitly conscious of the belief they implicitly hold,
- tendency to withhold judgment when evidence and reason are insufficient,
- courageous desire for best knowledge, even if such knowledge fails to support or undermines their and educator's propositions, beliefs, and self-interest,

- willingness to face and fairly assess ideas, beliefs, and viewpoints regardless of their belief in their own thinking,
- inclination to look deeply into an issue or situation, so as to avoid jumping into conclusions,
- the learner should have an inclination to trust their own reasoning skills and see themselves as a good thinker,
- trust in reason,
- an inclination to orderliness, logic, and coherence,
- self-confidence,
- assertiveness,
- a sense of humour and
- awareness of biases and prejudices.

It is important that the learning environment is such that it encourages the learners to engage in argumentation. The context should provide the learner with the opportunity to engage in deeper cognitive processing of assertions that encourages consideration and rebuttal of opposing opinions. The significance of such an environment is that it will encourage interactive dialectical dialogue, which is essential in argumentation. The educator should use the guidelines below to ensure a conducive context for argumentation (Modgil, 2009: 901-934; Osborne, 2010: 463-466). The guidelines are:

- create an enabling environment that is characterised by respect and trust in another's opinions,
- the learners must display cognitive willingness to engage in argumentation,
- the learner must have foundational, conceptual, procedural, and interdisciplinary knowledge to draw from during argumentation,
- argumentation and arguments are developed in an environment of advocacy, democracy, and open-mindedness,
- the context of argument develops from the convergence of the learner as an arguer, the questions asked, or the need to solve a problem, and fellow learners and educator as the audience,

- argument fields provide the learners with an understanding of the rules and conventions governing the development of arguments, as well as their interpretations,
- the context of the argument informs the learners of the rules, conventions, and constraints that should govern the development of the argument,
- the technical sphere of the argument adheres to rules that are formalised and rigorous, and are generated using domain-specific knowledge, for example the principles of monitoring body temperature,
- the arguments should be adapted to the appropriate sphere for which they are intended,
- the context provides the learner with an environment for making and interpreting arguments as well as a common ground for a framework for conducting disputes,
- use domain-specific knowledge to provide a language and set of rules for argument that govern how arguments are made and judged,
- provide rules to be used as a basis on which the arguments are developed and evaluated,
- the argument field defines rules for engagement and resolution and
- the context of arguments influences the forms of arguments, the basis on which inferences are made, and the means for deciding disputes.

Guidelines to use during the process of argument

Below are guidelines for the educator to use during the process of argumentation (Modgil, 2009: 901-934; Osborne, 2010: 463-466).

- Use learner presentation and small group discussions of ideas presented.
- Give the learners different or multiple theoretical, interpretations as precursors to initiate argument.
- Create cognitive dissonance in the learners' minds that will direct them towards engaging in dialogue.
- The learners undertake mental concept clarification to better argue their points.

- Present competing theories for the learner to examine, discuss, and evaluate, and present the evidence for them to construct arguments justifying the case for one theory or the other.
- Provide the learner with argument stems such as:
 - I) My argument is ...
 - II) My reasons are that ...
 - III) Arguments against my idea might be that ...
 - IV) I would convince somebody that does not believe me by ...
 - V) The evidence to support my argument is ...
- Provide the learners with examples of weak and strong arguments.
- Explain to the learners the importance of counter-arguments to an argument or rebuttals that challenge the justification of another argument.
- Encourage the learners to rebut claims or produce further evidence in the face of opposition.
- Encourage the learners to elaborate on their argumentation with support and counter-arguments to defend their views, leading to an improved quality of argumentation.
- Urge the learners to argue against any item of evidence that is not supportive of the theory they are defending.
- Characterise arguments and argumentation in terms of object, reasoning, context, activity, and goal.
- Encourage the learners to be persistent enough to objectively and thoroughly collect sufficient factual or textual evidence.
- Separate facts from assumptions.
- Avoid generalisation.
- Look for and identify patterns of thinking, for example reflective thinking and dialectical thinking.
- Make use of disciplined methods of probing.
- Pause, listen critically, and ponder.
- Encourage the learners to search for evidence outside their comfort zone.
- Look at each situation from a fresh perspective.
- Reveal the deficiencies of observations, inferences, and opinions by interrogating them, revealing the importance of evidence in argument,

- Expose the learners to the flaws in their observations, inference, and opinions by interrogating them and encouraging them to do the same to fellow learners' arguments, so as to make them aware of the importance of evidence in argumentation.
- Encourage the use of sound reasoning skills in argumentation e.g deductive, inductive, or hypothetico-deductive reasoning skills, application of supporting evidence that is representative of all sides, reasoning by analogy, and inference.
- Examine the logical structure of argumentation construction for example:
 - The learner will look at what the issue is that they have to respond to.
 - What is the context of the issue?
 - How are they going to support their viewpoint?
 - What do they need to learn more about the issue at hand?
 - How will they construct order and logic in their argument?
- Encourage the learners to support their arguments with evidence.
- Questions are examined and considered from different perspectives.
- They should weigh the evidence to determine which of several positions is plausible.
- Encourage tolerance of ambiguity and uncertainty that usually accompany interpretations.
- Repeatedly and explicitly model the cognitive operations necessary for successful argumentation – association, integration, advancing, critiquing and defending claims, generating reasons, supporting reasons with evidence, evaluating reasons, examining opposing sides, and developing reasons in argument.
- Allow the learners time to search for evidence to support their arguments.
- Allow time for silent thinking.

➤ *Analysis of Arguments*

- to analyse arguments the learners identify the premises and conclusions in an argument,
- the learners should identify the conclusion and look at whether the premises lead to the conclusion,

- the learners must decide whether the premises of an argument provide good reasons to accept the conclusion,
- encourage the formulation of counterexamples and counterarguments to test the plausibility or the truth of a claim made in an argument by the learners, and
- facilitate the use of counterexamples and counterarguments to rebut assumptions, preconceived ideas, fallacies, and generalisations.

➤ *Evaluation of Arguments*

- make learners aware of possible counterexamples that can be used to evaluate premises and conclusions of arguments,
- encourage critical examination of the plausibility of the claims that are made,
- learners should critically challenge assumptions, preconceived ideas, and fallacious reasoning,
- evaluate the impact of an argument,
- weigh possible solutions,
- the learners with the assistance of the educator clarify issues, make informed (supported by evidence) and reasoned decisions,
- encourage the formation of own opinion on issues by the learners,
- evaluate the soundness of arguments, namely the truth or strength of the premises of an argument – establishing whether or not the evidence provided by the premises is actually true,
- evaluate the validity of arguments – relationship between the premises and the conclusion of an argument,
- establish relevance by evaluating whether the reasons advanced by the arguer in support of the conclusion in an argument are relevant,
- take into consideration that more than one interpretation of an argument is possible,
- evaluate whether claims brought forth in support of a conclusion are compatible,
- apply field-independent standards to evaluate the correctness of evidence,
- learners to identify, classify, analyse, and critique arguments by comparing their structure and adequacy with prescripts of logical reasoning,

- encourage the use of dialectical argumentation to search for significant issues, identify alternatives, generate standards or criteria for selection, and use them to test proposals,
- through dialectical perspective enhance critical and comprehensive examination of all positions relevant to a topic,
- make an effort to seek out all points of view,
- use the logical approach to evaluate the soundness of an argument and
- provide sufficient depth to an issue for the learners to develop capabilities to make reasoned judgment about arguments.

➤ *Ending the Process of Argumentation*

- acknowledge the learners,
- demonstrate appreciation,
- de-role the learners,
- discuss outcomes of the argumentation process and
- outline the new knowledge gained and the different perspective.

Frames used for argumentation

i) Making a claim

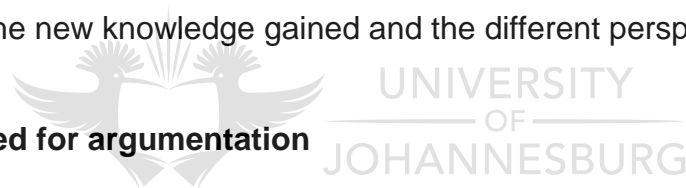
- I observed ... when
- I compared ... and...
- I noticed ... when...
- The effect of ... on ... is ...

ii) Providing evidence

- The evidence I use to support ... is...
- I believe ... (statement) because ... (justification)
- Based on ... I think

iii) Asking for evidence

- I have a question about ...



- Does ... have more ...
 - What causes ... to ...
- iv) Offering a counter-claim
- I disagree with ... because
 - The reason I believe ... is
 - What causes ... to ...
- v) Inviting speculation
- I wonder what would happen if ...
 - I have a question about ...
 - I wonder why ...
 - What do you think will happen when ...

Examples of teaching strategies for argumentation

- Debate

The process of formulating the debate issue and preparing the arguments enhance critical thinking. The learners examine and debate an issue, which brings them to a new level of awareness and helps them to develop the ability to recognise and appreciate the contextual complexities that exist (Hall, 2011: 16-19; Lowenstein & Bradshaw, 2013: 159).

- Brainstorming

The learners are allowed a free-flowing generation of ideas within an innovative and non-restrictive learning environment. The innovation and free-flow eliminates obsolete patterning and enables the learners to acquire new knowledge using their facilitated critical thinking (Sowell in Lowenstein & Bradshaw, 2013: 167).

- Simulation

Simulation promotes imagination as a way of encouraging the learners to use their facilitated critical thinking skills to explore their understanding of concepts and phenomena in different ways. They learn that there is not one solution to a problem, and they get an opportunity to develop different approaches to solving a problem (Lowenstein & Bradshaw, 2013: 121).

- Concept mapping

Concept-mapping stimulates the learners critical thinking skills by encouraging them to connect new knowledge to their prior learning, as well as affording them an opportunity to gain further, wide, and varied knowledge of a number of concepts in a short period. New information is linked to their existing conceptual framework, enabling them to construct new meaningful interconnection, so that their existing concepts are transformed, enriched, revised, and conceptual change occurs (Gravett, 2005: 20-21; Hilbert & Renkl, 2008: 53-73).



Examples of assessment strategies in argumentation

- Poster presentation

Poster presentations challenge the learner's ability to plan, design, and present their meaningful interpretation and feelings about a clinical event or phenomenon. Their facilitated critical thinking skills to identify, classify, and interpret salient points and to develop creativity to add meaning are assessed (Bruce et al. 2011: 1).

- Research paper presentation and critiquing

Learners get an opportunity to critically analyse previous studies. Analysis, explanation, inferring, and synthesising skills of the learners are assessed (Burns & Grove, 2009: 564).

- **Reasoning**

Reasoning involves the use of inductive, deductive, hypothetico-deductive and dialectic dialogic reasoning. For the purpose of this programme the researcher chose the dialectic dialogic reasoning as one of the methods to facilitate critical thinking.

Dialectic dialogic reasoning

Dialectic dialogic reasoning refers to the philosophical method of formal inquiry. It is a process in which a questioner response process is followed and guided by rules of formal logic, in which the interlocutors begin with a set of questions in their search for answers and ultimate truth. It allows for the acceptance of alternative truths and ways of thinking. Dialectic dialogic reasoning is a form of testing the explanations given for how and why things are the way they are. Dialectic thinking consists of an exploration of contradictory possibilities that result in cognitions that reduce cognitive dissonance (Freely & Sternberg, 2009: 152).

This means that mental contradictions and discomfort that occurs in the learner's mind during interaction with others, directs them towards knowledge-construction aimed at quietening the disequilibrium created by contradictions that arise from the interaction (Armstrong, 2011: 10). Dialectic dialogic reasoning considers dialogue arising from diverse perspectives. It is a kind of social relation that engages participants. The dialectic dialogue that ensues involves a dialogue that involves a willing partnership and cooperation in the face of likely disagreements, confusion, failures, and misunderstanding. It involves examining factors that oppose each other and making sense of them by merging them into a single unit or idea that is greater than either of them on their own (Burns & Grove, 2009: 6; Freely & Sternberg, 2009: 152; Magrini, 2012: 3).

The learner and the educator need to maintain a particular attitude that enhances dialectical dialogic reasoning in the classroom. The attitudinal traits necessary are the following (Freely & Sternberg, 2009:152):

- learners maintain openness to reason about their thoughts,
- educator should make their competence and experience clear without displaying a superior attitude,
- educator should ensure a non-judgmental learning environment that allows for a feeling of safety,
- educator should ensure that trust is demonstrated by empathetic dialogue,
- the learning environment enhances the valuing of the individual learner's integrity in a manner that welcomes the worth and expression of their true self without fear of threat or blame,
- educators keep their egocentric perspectives in check,
- learners need to practise fair-mindedness,
- learners have equal status in the discussions and
- exhibit a disposition to engage critically and respectfully.

The context that allows for dialectic dialogue to take place is regarded as follows (Akbari, 2008: 276-283, Wegerif, 2009: 347-361):

- the learning environment should enhance a culture of intellectual challenge and dialectical dialogue between the educator and learner and between fellow learners,
- the environment should enhance an explicit attitude of reciprocity,
- the context must allow for interaction that is based on argument and predisposition to engage both critically and respectfully,
- the learning environment should be one where the learner “takes to heart” what a fellow learner says, even if it challenges their thinking and vice versa and
- ensure a learning environment that allows for collaborative dialogue and interaction.

Guidelines for dialectical dialogic reasoning

After creation of cognitive dissonance in the learners' minds, the second phase follows whereby the learner interactively constructs conceptual knowledge through a dialectical dialogue between themselves, the educator, and their fellow learners. This phase is an interactive construction process of new knowledge (Armstrong, 2011: 1-25; London, 2010: 1-9):

- the learners and educator engage in disputation and conversation within an intentional, logical, and constructivistic learning environment,
- the educator starts the dialogue with commonly held views and ideas,
- ensure that dialogue leads to critical reflection among the learners,
- the learners engage critically but constructively with each other's ideas,
- encourage the learners to continually express their point of view,
- encourage examination of issues from multiple perspectives with an aim of highlighting complexities,
- urge the learners to test the strengths and weaknesses of opposing points of view,
- ensure that the learners see the educator model dialectical dialogic reasoning,
- direct the learners toward exploration and interrogation of ideas,
- the learners use dialogue to analyse the merits of a perspective using the dialectical manner of reasoning,
- direct the learners thinking towards using the dialectical process to thoughtfully examine an issue that bears contradictory truths,
- encourage learners to question, probe, and carefully analyse ideas,
- guide the learners to identify inconsistencies in others' opinions and viewpoints,
- encourage learners to search for acceptable viewpoints and opinions in order to gradually attain deeper understanding and insight,
- direct the learners to connect ideas brought up in discussion,
- learners should consider fairly and equally challenges or questions raised regarding a particular issue, in order to arrive at a better understanding,
- the educator should use concrete examples to raise general issues while focusing on conflicts between value systems rather than between learners,

- encourage the learners to carefully think out positions and ensure that they are plausible and defensible,
- direct the learners to use critical insight to support their own views and point out flaws in self and others' views,
- allow the learners to express emotions accompanying strongly held beliefs, and minimise the level of mistrust before pursuing practical objectives,
- encourage learners to justify their reason for a certain position on a specific issue and
- encourage the learners to connect generated ideas in order to articulate an informed representation of reality.

Examples of teaching strategies using dialectic dialogic reasoning

- Case study

The learners collect, organise, and present data collected from a real-life situation, e.g. a clinical situation. Case studies are used to teach learners to think and reinforce the need to understand the concepts in real-life situations (Lowenstein & Bradshaw, 2013: 34).

- Value clarification

Value clarification enables the learners to become consciously aware of the values and underlying motivations that guide their actions, and provides opportunities for them to clarify and defend their values while they are aware of the values of others (Bruce et al. 2011: 179; Chabeli, 2012: 56).

Examples of assessment strategies for dialectical dialogic reasoning

- Portfolio assessment

Portfolio assessment could be used for comprehensive assessment assembled consciously from a number of tasks produced over a semester or year. The learner and educator work together to select the themes for the portfolio (Gravett, 2005: 21).

- Interview assessment

Interview assessment may be used to assess the learner's progress in specific learning areas. Regular non-directive interviews with the learners will assist in ascertaining the depth of the learner's critical thinking skills and how well they use them (Chabeli, 2005: 4).

- ***Co-operative/collaborative learning***

Co-operative learning involves learners working collaboratively with each other with an aim of achieving the learning outcomes (Barker et al., 2013: 1-18; Coakes et al. 2008: 12-35; Costa, 2008: 251-254; Shimazoe & Aldrich, 2010: 52-57; Slavin, 2011: 160-166).

The learners and educator should exhibit the following attitudinal traits in a co-operative/collaborative learning environment.

- A willingness to co-operate and work collaboratively with others.
- Being willing to take the back "seat" at other times and allow others to lead.
- A keen interest on the group success.
- Willingness to take responsibility for the group success.

The environment in co-operative learning should allow for the following:

- Positive interdependence which allows for co-ownership and co-responsibility for the learning experience.
- A learning environment that allows for cathartic intervention when there is a need to defuse emotions.
- Enhance the learners' positive self-image.
- Learning climate conducive to group interaction.
- Ensure a culture sensitive environment.
- Promote a social atmosphere of interaction.
- Non-judgmental.

Guidelines for co-operative/collaborative learning

- Foster open-mindedness, freedom of choice, mutual respect, trust, empathy and tolerance among the learners and educator.
- Thoughtful use of cognitive language.
- There must be tolerance of diversity.
- Ensure mastery of habits of the mind (critical, creative and self-regulation).
- Encourage a feeling of individual accountability.
- Ensure principles of democracy such as equal status of each learner and positive dialogue.
- Assist learners to manage negative emotions in a manner that will not destabilise the group.
- Ensure that group activities are structured accurately in writing to avoid confusion.
- Encourage learner involvement and participation.

Examples of teaching strategies to use in co-operative/collaborative learning.

- Jigsaw



In a Jigsaw exercise the educator is responsible for structuring the activity with thoughtful prompts and perhaps providing appropriate resources, but learners take responsibility for obtaining and conveying new knowledge. The Jigsaw format requires each learner to be both an educator and a careful listener during the exercise, yet no one student is required to do the front lines digging on all the topics. This exercise also naturally gets every learner in the classroom talking and interacting with peers.

The rearrangement inherent in the Jigsaw method also promotes interactions with classmates a learner might not otherwise encounter as well as provides a burst of physical activity that can help maintain attention (Lom, 2012: 64-71).

- Think-pair-share

Think-Pair-Share communicates that all learners are expected to think about the issue posed. It thereby reduces the chances that when the educator poses a question to the class that most students will skip thinking an answer, counting on an eager or attention-seeking classmate to save the day. Similarly, dedicating time to think quietly also allows learners who need just an extra moment to organize their thoughts (or gather their courage) a chance of contributing to the discussion. Not only does Think-Pair-Share encourage all learners to think, it allows all of them to talk (Lom, 2012: 64-71).

Example of assessment strategies in co-operative/collaborative learning.

- Peer assessment

Peer assessment is an educational arrangement where students judge a peer's performance quantitatively and/or qualitatively and which stimulates students to reflect, discuss and collaborate (Strijbos & Sluijsmans, 2010: 265-269).

c) Evidential dimension



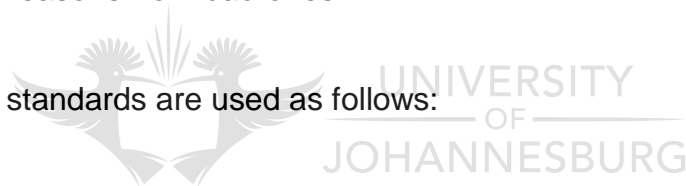
Evidential consideration refers to a process of looking at the evidence at hand or in their minds and making a decision. Learners should display investigative skills, justification, and provision of a trail of evidence as skills that are necessary for supporting claims and arguments (Geelan & Fan, 2014: 249-270). Learners use evidential considerations to explain the assumptions they make about problems that require them to produce solutions. The justification process requires the learner to use heuristics. Heuristics are simple and efficient rules hard coded by evolutionary processes or learned, which have been proposed to explain how people make decisions, come to judgments, and solve problems or incomplete information (Dougherty, 2009: 102; Klopfer & Squire, 2008: 203-228).

d) Criteriological dimension

Criteriological considerations involve intellectual criteria or standards used to assess learners' critical thinking. Assessment of learners' reasoning focuses on the dimensions of reasoning and the intellectual standards against which it is measured. Mastery of the intellectual standards requires the learners to be able to (Paul and Elder, 2010: 1-4):

- recognise clarity versus unclear;
- distinguish accurate from inaccurate accounts;
- decide when a statement is relevant or irrelevant to a given point;
- identify inconsistent positions as well as relatively consistent ones;
- discriminate deep, complete, and significant accounts from those that are superficial, fragmentary, and trivial;
- evaluate responses with respect to their fairness;
- prefer well-evidenced accounts to accounts that are unsupported by evidence; and
- tell good reasons from bad ones.

The intellectual standards are used as follows:



Clarity

- Arguments or claims are easier to understand.
- The learner gives concrete and specific examples.

Depth

- The argument conforms to fact or truth.
- Arguments or claims address complexities in a question.

Logic

- Explanations, claims, or arguments make sense.
- The learner's reasoning process is logical.
- Conclusions follow clearly from formulated hypotheses.

Completeness

- All arguments are provable.
- The extent to which the learner provides complete information.

Consistency

- The learner's thinking, action, and claims are congruent.

Relevance

- The learner's arguments or claims relate to the matter at hand.
- There is a close logical relationship between arguments or claims.

Breadth

- The scope of the argument covers all the important aspects of the issue at hand.

Accuracy

- There is precision and authenticity in the presented information.



5.2.4 Outcomes

Outcomes are the results of learning processes, and refer to the knowledge, skills, attitudes or predispositions, and values (Shephard, 2008: 87-98). The learner who graduates at the end of this programme should be able to use their facilitated critical thinking skills to:

- solve problems and make decisions,
- exhibit global competence and
- demonstrate good citizenry.

5.3 SUMMARY

This chapter consists of the description of the programme using an integrated framework for programme design. The different aspects considered during critical thinking and the outcomes of this programme are described. The critical thinking considerations include the contextual, conceptual, methodological, criteriological, and evidential aspects of critical thinking.



CHAPTER 6

PROGRAMME IMPLEMENTATION AND EVALUATION

6.1 INTRODUCTION

The purpose of this chapter is to describe the implementation and evaluation of the developed programme. The programme was developed from the conceptualisation information as describe in chapter four. It consists of the structure, learning content selected, programme learning outcomes and methods to facilitate critical thinking. The implementation of the programme is also based on the programme where the five learning outcomes were derived.

6.2 IMPLEMENTATION OF THE PROGRAMME USING THE METHODOLOGIES OF THE CRITICAL THINKING FRAMEWORK.

The researcher used the paper-case scenario approach to teaching and learning because this approach augers well with the use of reflection, Socratic inquiry, argumentation, and the dialectical dialogic reasoning approach to teaching. The case scenario is built up from scenario to scenario to cover the learning outcomes of the selected content according to the level of complexity of thinking. Case scenarios of ill-structured problems were given to the learners to solve while using a particular methodology to facilitate their critical thinking. The choice of a particular strategy was based on the learning outcome of the content to be taught. In certain instances more than one methodology was used in a lesson. The learners were observed with each lesson and reflective notes were written by the researcher during and after each lesson. This information was used to enrich the feedback that was sought from the learners as to how they experienced the programme post the implementation. During the lessons the educator assisted the learners by directing their thinking towards using their foundational knowledge, for example concepts and definitions, interdisciplinary knowledge like sociology and psychology, and procedural knowledge to construct conceptual knowledge. The learners were made aware that it is important to use these different kinds of knowledge to construct conceptual knowledge.

The researcher used the content on emergency nursing care as described in the learners' study guide, and as directed by the South African Nursing Council's (SANC) prescripts of the curriculum (**Annexure I**), the objective being that the learners' planned academic year and the content that was to be covered was not tampered with as the programme was implemented. The researcher integrated the content on asphyxia with pulmonary oedema, as would be seen in a patient with burns and smoke inhalation. Following the implementation, the researcher evaluated the programme through feedback that was given by the learners during focus group interviews. Assessment was done after each learning activity. Assessment was built from simple recall to higher order thinking through the use of labelling of diagrams, concept mapping, self-assessment, peer assessment, and writing reflective narratives and persuasive essays.

The programme was evaluated through focus group interviews wherein the learners gave the researcher feedback on how they experienced the programme. The evaluation is described later in this chapter.

6.2.1 Learning content selected

The researcher selected the content from the Emergency Care module that deals with asphyxia and pulmonary oedema as seen in smoke inhalation section in the learners' learning guide as prescribed by the SANC.

6.2.4 Programme learning outcomes formulated from the process of the programme

At the end of the lesson the learners should be able to:

- Demonstrate foundational knowledge of the anatomy of:
 - the heart and the respiratory system.
 - Draw a concept map on the gaseous exchange during respiration

- Reflect on the clinical manifestations of the following conditions in a burn patient due to smoke inhalation:
 - asphyxia; and
 - pulmonary oedema.
- Debate how Socratic method of questioning can be used to elicit indepth subjective and objective data, and indicate how the data collected was used to arrive at an appropriate nursing diagnosis of the patient.
- Through argumentation use all the evidence collected to design a nursing care plan and debate the standards/criteria required for the plan to be successful.
- Use dialectic dialogic reasoning to debate the ethical dilemma of “Do Not Resuscitate” instruction from the doctor following the complications that arose due the respiratory arrest of the patient.

6.2.5 Methods to facilitate critical thinking

The methods involved the lessons that were planned and taught by the researcher. The researcher used the critical thinking methods namely, reflection, Socratic questioning, argumentation, and dialectical dialogue to meet the learning outcomes.

Learning Activity 1: Acquisition of foundational knowledge as a basis for facilitating critical thinking

The aim

The aim was to stimulate the learners’ pre-requisite knowledge, which would form the foundation of the content that had to be dealt with during facilitating their critical thinking.

The nature of the learning context

The researcher tested the pre-requisite knowledge of the learners. The learners were given a paper case scenario to analyse after which they were requested to label the diagrams of the heart and respiratory system, and to write a concept map on the process of gaseous exchange (refer to Annexures H).

The learners' foundational knowledge of the anatomy of the heart and the respiratory system, and mapping out the concepts responsible for gaseous exchange was tested with the aim of using it as a basis for facilitating their critical thinking skills. The researcher encouraged collaboration between the learners by facilitating the use of their existing knowledge.

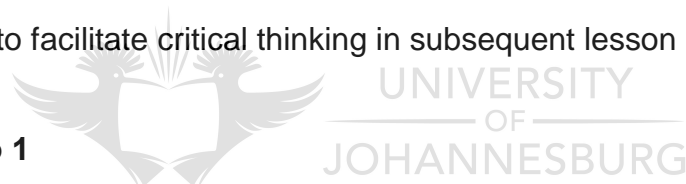
The aim was to ensure that the learners shared their knowledge and learning strategies, and that they treated each other with respect, while focusing on facilitating their critical thinking skills during this lesson. Table 6.1 represents the plan of Lesson 1 to meet the first learning outcome.

TABLE 6.1: Lesson plan for the acquisition of foundational knowledge as a basis for facilitating critical thinking

Subject Area	Fundamental Nursing Science - Module 1 (Emergency Nursing Care)
Level	1st Year
Content	Asphyxia and pulmonary oedema in burn patients
Learning Outcome	At the end of the lesson the learners should be able to: <ul style="list-style-type: none">• Demonstrate foundational knowledge of anatomy by labelling the diagram of:<ul style="list-style-type: none">- The heart- The respiratory system• Draw a concept map on gaseous exchange
Preparation	<ul style="list-style-type: none">• Use humour to put the learners at ease• Create a conducive learning environment to facilitate critical thinking by:

	<ul style="list-style-type: none"> - Maintaining and encouraging openness, respectful dialogue, inquiring mind, reason, equity in the learning environment.
Procedure	<p>Give a paper scenario to the learners to analyse.</p> <p>Instruct the learners to:</p> <ol style="list-style-type: none"> 1. Label the diagram of the heart and the respiratory system. 2. In collaborative groups of two or three compare and discuss answers with co-learners. 3. Draw a concept map on the process of gaseous exchange during respiration and discuss the rationale for your answers with a co-learner
Assessment	<ul style="list-style-type: none"> • Self and peer assessment of the labelling during the group activities

The learners were given the ill-structured paper scenario below, which they had to analyse, discuss with a peer, and answer the questions that were asked. The paper scenario was used as a foundation to build on in demonstrating the implementation of other methods to facilitate critical thinking in subsequent lesson plans.



Case Scenario 1

Mr Lilydale, a 48 year old male patient is admitted to your unit with 54% chemical burns involving the face, chest, and back. He works at a chemical factory, where a cylinder with a chemical substance exploded. His lungs and heart may have been affected. Read the instructions below.

Learning Activity 2: Demonstrate the ability of the learners to use reflection to construct new knowledge using their facilitated critical thinking skills.

The aim

The aim is for the learners to reflect on the clinical manifestations of asphyxia and pulmonary oedema. The focus was to create in the learners a cognitive situation of dissonance that would make them aware of their knowledge gaps, and make them want to seek further information in order to construct new conceptual knowledge.

The nature of the learning context

The researcher explained to the learners what is entailed in reflection, and the attitude that they needed to display during reflection, based on the guidelines formulated in the conceptualisation chapter.

The learners were urged to exercise an active desire to listen and to exhibit wholeheartedness that included thorough interest, sincerity, and open-mindedness in what was happening during teaching and learning. They were encouraged to tolerate diversity, disagreement, and uncertainty. The learners were also encouraged to exercise honesty and a confrontational attitude with self, while bracketing prior judgment and harnessing bias.

The researcher further ensured that the learning environment was conducive to reflection in that the learners were afforded enough time to reflect. An enabling environment and a psychologically safe space were ensured by allowing the learners to express their opinions. They were encouraged to voice their point of view without fear of being ridiculed, and were afforded an opportunity to reflect. Furthermore, it was ensured that the environment prompted the learners to explore what they believed was important at that particular time. Critical thinking was integrated into the content on “Asphyxia and pulmonary oedema in burn patients”. Reflective activities were contextualised, appropriate, and meaningful. Table 6.2 represents the plan of Lesson 2 to meet the second learning outcome.

TABLE 6.2: Lesson plan for demonstrating the use of reflection as a basis for facilitating critical thinking

Subject Area	Fundamental Nursing Science - Module 1 (Emergency Nursing Care)
Level	1st Year
Content	Asphyxia and pulmonary oedema in burns
Methodology	Reflection
Learning Outcome	<p>At the end of the lesson the learners should be able to:</p> <ul style="list-style-type: none"> • Reflect on the clinical manifestations in a burn patient with smoke inhalation, presenting with the following conditions: <ul style="list-style-type: none"> - Asphyxia and - Pulmonary Oedema.
Preparation	<p>Brief the learners about what reflection is and the attitude necessary in reflection:</p> <ul style="list-style-type: none"> - Humour was used to put the learners at ease - Create an enabling environment and psychological space for the learners to reflect when responding to enquiries. - Ensure that the learning environment encourages re-evaluation of conclusions made. - Provide an emotionally supportive learning environment by observing democratic principles. - Create a learning environment conducive to authentic tasks that include ill-structured scenarios/problems that encourage reflection and prompt the learners to explore what they think is important at a given time.
Procedure	<ul style="list-style-type: none"> • Give the learners contextualised, appropriate, and meaningful reflective activities by giving them an ill-structured paper scenario to analyse. • Using reflective activities, create in the learners' mind an awareness of gaps in their cognitive knowledge structure. • Trigger in the learner's mind the process of reflection through questioning or activities that initiate cognitive dissonance, perplexity and discomfort and awaken in their minds a need

to resolve the existing cognitive dissonance by asking the following question:

- Reflect on the clinical manifestations of:

Asphyxia

Pulmonary Oedema

- Write down ideas as they come to mind.

- Make allowance for enough wait-time to allow the learners to reflect.
- Encourage the learner to cognitively identify theoretical constructs to be able to understand the problem at hand (constructs are from foundational, procedural, and interdisciplinary knowledge).
- Allow dialogue between the learners to reconstruct and reorganise knowledge.
- Direct learners towards individually generating new cues and ideas, and collectively through dialogic interaction.
- Encourage independence without relinquishing the analogies, and sort out ideas using their intellectual tools.
- Encourage the learners to challenge their own perceptions and those of others that emerged during the reflection as they:

- Compare and contrast their ideas with those of fellow learners

- Encourage the learners to assess claims and arguments.
- Guide the learners towards appraising accuracy of information at hand by assessing credibility, contextual relevance, acceptability, and ascertain authenticity and validity before interpreting it.
- Encourage the learners to make objective and thoughtful meta-cognitive self-assessment of their own opinions and the reasons for holding them.
- Encourage the learners to examine their views on a controversial issues raised with sensitivity to the possible influences of their personal bias or self-interest.

	<ul style="list-style-type: none"> • Guide the learners towards identifying and reviewing their reasons and reasoning processes in coming to a conclusion. • Guide them towards examining their own and others' judgments for relevance and appropriateness. • Direct the learners towards making a decision and giving feedback to the rest of the group.
Assessment	<ul style="list-style-type: none"> • Self- and peer assessment throughout the reflective process as they compare their answers with those of their peers. • Give a quick quiz on the clinical manifestations of asphyxia.

The learners were given the paper case scenario below to analyse and answer the questions that followed as the second learning activity. The scenario below was built on previous one.

Case Scenario 2

Mr Lilydale, a 48 year old male patient is admitted to your unit with 54% chemical burns of the face, chest, and back. He is working at a chemical factory, where a cylinder with a chemical substance exploded. His lungs and heart may have been affected.

Mr Lilydale is awake and is able to communicate. He tells you that there was a lot of smoke in the room where he was, and that he laid there for some time before he got help. He developed difficulty in breathing.

Carefully read the case scenario above and answer the questions that follow below.

Instructions to the Learners

1. Reflect individually on the clinical manifestations of asphyxia in order of their priority.
2. Write down the ideas that come to mind as you reflect. Use your foundational and interdisciplinary knowledge as a frame of reference.

3. Compare and contrast your notes with those of the learners besides you. Challenge your perceptions and those of your peers that emerge during your discussion (Question your own and your peers' thinking processes).
4. Reflect individually on the clinical manifestations of pulmonary oedema
5. Test the accuracy of information you have at hand by assessing if it is credible, it is relevant to the content of asphyxia and pulmonary oedema, acceptable, authentic, and valid before you interpret it.
6. Categorise, decode significance, clarify meaning of emerging cues, consider alternative meanings, and sort and classify the information you came up with. Organise the clinical manifestations according to cardiovascular and respiratory systems signs, and give feedback to fellow learners.

Learning activity 3: Demonstrate the use of Socratic questioning as a basis to facilitation of critical thinking.

The aim

The aim was to construct and engage Socratic questions in order to explore and analyse the subjective and objective data to demonstrate how they arrived at an appropriate nursing diagnosis of the patient.

The nature of the learning environment

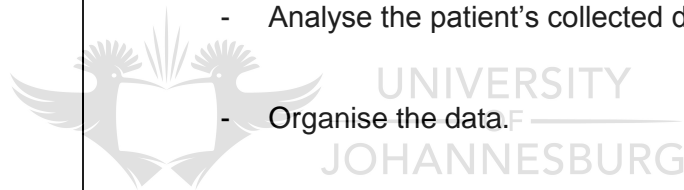
The researcher ensured that the learning context facilitates questioning. The learning/teaching environment was conducive to freedom of expression and facilitating critical thinking. Mutual respect among the learners and freedom of expression, without fear of prejudice or bias was encouraged. The learning environment was such that it promoted the principles of democracy where an open and trusting environment was created and everyone was treated equally. The environment encouraged Socratic questioning and dialogue, as everyone was made aware of how important their input was to the discussion. The researcher allowed for enough wait time and created an enabling environment and space for the learners to reflect when responding to questions.

The learning environment was such that it prompted the learners to explore the subjective and objective data by responding to the Socratic questions asked to direct them towards formulating an appropriate nursing diagnosis. Furthermore, the learners were made aware that no answer was considered right or wrong, as exploration of data is at the centre of Socratic Method. The learners were given the scenario below to read and analyse, after which they had to answer the questions that followed. Table 6.3 represents a lesson plan to meet the third learning outcome.

TABLE 6.3: Lesson plan to demonstrate the use of Socratic questioning by exploration and analysing of the subjective and objective data in order to arrive at an appropriate nursing diagnosis.

Subject Area	Fundamental Nursing Science - Module 1 (Emergency Nursing Care)
Level	1st Year
Content	Asphyxia and pulmonary oedema in burns
Methodology	Socratic Method of questioning.
Learning Outcome	At the end of the lesson the learners should be able to: <ul style="list-style-type: none"> - Demonstrate the use of the Socratic questioning method to explore and analyse the subjective and objective data, and demonstrate how an appropriate nursing diagnosis of the patient was reached or arrived at.
Preparation	Request the learners to pre-read content on asphyxia and pulmonary oedema in burns. Learning environment should: <ul style="list-style-type: none"> • Allow for mutual respect among the learners • Guide the learners to freely express their opinion without fear of prejudice or bias. • Exercise and adhere to principles of openness and trust. • Create a learning environment that is conducive to cultural tolerance and accommodation. • Environment to encourage dialogue • Environment should be emotionally supportive. • Determine timing and the tools needed to implement the lesson.

	<ul style="list-style-type: none"> • Allow sufficient time to construct thought-provoking questions and answers. • Prepare for facilitating the discussion that should follow a good questioning period. • Use questioning spontaneously as an exploratory strategy. • Design questions to assess the various cognitive skills and sub-skills associated with critical thinking. • Phrase questions appropriately so that the learners do not feel belittled by the questioning experience.
<p>Procedure</p>	<p>An ill-structured paper scenario was given to the learners to analyse. The researcher started the questioning and guided the learners to:</p> <ul style="list-style-type: none"> - Adhere to the questions that needed to be answered. - Ask the question “why”. - Analyse the patient’s collected data. - Organise the data. - Cluster the data accordingly. <p>The learners were guided and gently nudged through questioning to examine the issues taken for granted, such as assumptions and beliefs before:</p> <p>Reviewing and verifying findings.</p> <p>Formulating diagnostic statements appropriate to the patient’s health needs.</p> <p>They were allowed to use interactive dialectic dialogue to reconstruct and reorganise knowledge.</p> <p>The researcher encouraged the learners to challenge perceptions that emerge during the interactive dialogue.</p>



The researcher asked reflective questions that went beyond the foundational and conceptual knowledge to broaden the learners' perspectives, and reframe their thoughts and insights.

The process of inquiry was monitored during the learner interaction.

The learners were discouraged from coercion and manipulation.

The researcher formulated questions that facilitated an attitude of critical inquiry.

Learners' verbal and non-verbal responses were monitored.

Cooperative questioning was encouraged through questions generated by the learners.

The researcher tolerated learner silence.

The process of inquiry was monitored during the learner interaction.

The learners were discouraged from coercion and manipulation.

The researcher formulated questions that facilitated an attitude of critical inquiry.

Learners' verbal and non-verbal responses were monitored.

Cooperative questioning was encouraged through questions generated by the learners.

The researcher tolerated learner silence.

The researcher encouraged the learners to maintain fairness and honesty in examining the thoughts of others and their own.

The learners were asked for justification of assertions, and the researcher continued probing for reason and justification.

	<p>A new question was not asked until a preceding one was answered.</p> <p>The learners were allowed to independently seek information, formulate diagnostic statements and criteria to clarify issues/arguments for assessment and making judgments.</p> <p>The learners were encouraged to express their thoughts clearly to be understood by others, and to grasp the thoughts of others. The researcher insisted on precise and shared understanding.</p> <p>The researcher responded to all answers with a further question that called upon the learner to develop their critical thinking in a fuller and deeper manner.</p> <p>The researcher and learner aimed to understand where possible, the ultimate foundation for what it is said or believed and follow the implications of those foundations through further questions.</p> <p>All assertions were treated as a connecting point to further thought.</p> <p>All thoughts were treated as though they required development.</p> <p>The researcher made the learners aware that any thought can only exist fully in a network of connected thoughts. The learners were stimulated through questioning to pursue those connections.</p>
Assessment	<ul style="list-style-type: none"> • A case study was given as a form of assessment where the learners were questioned, leading to answers regarding a condition.

The researcher monitored the enquiry process during Socratic questioning, and directed the learners towards individual generation of cues and ideas, as well as collectively. Their critical thinking was directed towards making interdisciplinary connections with the content through guided reflection. They were stimulated to ask higher order questions. The learners were requested to pre-read asphyxia and pulmonary oedema in burns, and then work through the given scenario below to meet learning outcome number three.

The scenario is built on the first scenario. It arose from the previous activity in which the learners generated foundational knowledge, and use of reflection as a basis to facilitate critical thinking.

Case Scenario 3

Mr Lilydale, a 48-year-old male patient, is admitted in your unit with 54% chemical burns to the face, chest, and back. He works at a chemical factory, where a cylinder with a chemical substance exploded. His lungs and heart may have been affected.

Mr Lilydale is awake and is able to communicate. He tells you that there was a lot of smoke in the room where he was and that he laid there for some time before he got help.

On observation you notice that he has difficulty breathing and has noisy/gurgling breath sounds. His nostrils are flaring and he has cyanosis and is using accessory muscles for breathing. He is anxious, restless, and frothing at the mouth. You further observe that he is cyanosed and capillary refill is slow. His skin is cold and clammy, with a lot of serous fluid oozing from his wounds. To verify the data collected through observation, you decided to monitor vital signs, blood pressure, measure oxygen saturation, and do a urine analysis. Following are your findings.

Findings: Vital signs

1. Heat Regulation

Temperature: 35° Celsius

Cold and clammy skin

Socratic Questions asked that led to the formulation of a nursing diagnosis:

- What does a temperature of 35°C mean? (It means the patient has hypothermia).

- What is the cause of the hypothermia? (The hypothermia is caused by the loss of heat through the large surface area that has been burnt).
- What is the relationship between hypothermia that the patient is presenting with and the large burnt surface area? (The function of the skin is to serve as a barrier that preserves body heat – therefore if the barrier is lost the patient loses heat through their wounds).
- Could you please explain your reasoning? (Large surface area is burnt → loss of skin which serves as a barrier → inability of the body to preserve heat → excessive body heat is lost through the burn wounds → decrease in the body heat → hypothermia).
- What are the body structures involved in temperature regulation? (Temperature is regulated by an integrator in the hypothalamus, sensors in the periphery and in the core and effector system that adjust the production and loss of heat).
- How is the temperature regulated? (The hypothalamic integrator is the centre that controls the core temperature. When the integrator detects heat it sends out signals intended to reduce the body temperature and increase loss. In contrast when cold sensory receptors are stimulated the integrator sends out signals to increase heat production and prevent loss).
- Where are these sensory receptors found? (Most of these sensory receptors are found in the skin).
- What can we then deduce about this patient's temperature since a large surface area of the skin is burnt? (As mentioned earlier, the skin serves as a barrier that preserves heat, and in this instance it is burnt and therefore the sensory receptors found in the skin are also damaged by the burns. This means that messages cannot be sent to the hypothalamus to kick-start the regulatory process that would preserve the body temperature, we can therefore conclude that the patient has:

Impaired body temperature regulation related to burns as evidenced by a temperature of 35°C.

2. Cardiovascular System

Pulse : 120 beats/minute, regular and bounding

Blood Pressure: 85/50mmHg

Socratic questions that led to the second nursing diagnosis

- What is your understanding of the concept “tissue perfusion”? (The volume of blood that flows through a unit quantity of the tissue, and is often expressed in unit: ml blood/100 g tissue).
- Looking at Mr Lilydale would you say his tissues are well-perfused, and give a reason for your answer? (No, because the patient’s low blood pressure is an indication of loss of body fluid, which results in a low blood pressure, which in turn indicates an alteration in the tissue perfusion).
- What evidence do you have to support your deduction about the patient being in an altered tissue perfusion state? (The fact that the patient has a pulse rate of 120 beats/minute, low blood pressure, and cold extremities).
- Is a pulse rate of 120 beats/minute normal for an adult, justify your answer. (It is not normal because a healthy adult’s pulse rate ranges from 60-100 beats/minute).
- Now that we have drawn the inference that Mr Lilydale’s pulse is not normal, what do you understand about a pulse rate of 120 beats/minute with reference to this particular patient? (Patient has lost a lot of body fluids through his wounds→ a decrease in the blood pressure, which led to → heart beating fast in trying to compensate for the ↓blood pressure and ↓fluid volume).
- How is the diminished urinary output of the patient related to the low blood pressure and rapid heartbeat? (Low blood pressure and a rapid heartbeat as the heart is trying to compensate are indications of impaired tissue perfusion, it means with the kidneys being not well perfused and the decreased body fluid volume that the patient will pass a small amount of urine.
- What conclusion can we then draw about the patient’s findings in the cardiovascular system? Please also explain how you got to that conclusion.

(Patient lost body fluids through his wounds → a ↓ blood pressure → stimulation of the heart to beat fast in an attempt to compensate, inadequate fluid volume in circulation → inadequate perfusion of the kidney tissue → ↓ urinary output therefore the conclusion is that the patient has:

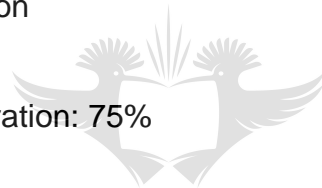
Ineffective tissue perfusion related to low blood pressure as evidenced by a cold and clammy skin, rapid pulse rate and decreased urinary output

3. Respiratory System

Respiration: 28 breaths/minute

Hypoventilation

Oxygen saturation: 75%



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Cyanosis

Socratic Questions asked on the respiratory system were:

- What does a respiratory rate of 28 breaths per minute mean? (Patient's breathing is rapid/fast which means he has tachypnoea).
- What is the normal respiratory rate for an adult of Mr Lilydale's age? (The average respiratory rate for an adult is 16 breaths/minute, and the range is 12-20 breaths per minute, therefore the patient has an abnormal respiratory rate).
- How did you arrive at that conclusion, could you explain your reasoning? (The patient has a rapid and shallow breathing pattern with hypoventilation due to inadequate lung expansion characterised by shallow respirations).
- What is the reason for your argument? (Patient has possible smoke inhalation, which means the inhaled chemicals → irritation of the respiratory tract mucous

membrane → oedema and bronchospasms with resultant decreased oxygen intake, therefore the rapid respiratory rate is a compensatory mechanism for the diminished oxygen in the body).

- How is the information above related to flaring of nostrils and the use of accessory muscles of respiration? (These are the signs that the patient is having difficulty in breathing brought about by the oedema of the respiratory tract and bronchospasms).
- What is your interpretation of the patient presenting with an oxygen saturation of 75%? (It means the patient's perfusion is altered because of inadequate oxygen in circulation).
- How will a patient with oxygen saturation of 75% present? (Cyanosis, ↑ respiratory rate, flaring nostrils and use of accessory muscles).
- How did you arrive at that conclusion, please explain your reasoning? (Patient has oedema of the respiratory tract and bronchospasms → inadequate intake of oxygen → decreased amount of oxygen in the blood → poor perfusion of the tissue which results in oxygen saturation of 75%).
- Why is the patient presenting with cyanosis? (Patient has hypoxia due to the ineffective breathing → reduced peripheral blood flow → decreased oxygen supply to the periphery resulting in cyanosis).
- Is there information that we still need to consider regarding the patient's respiration?
- Having considered all this data what conclusion can we then make about his respiration? The conclusion is that the patient has:

Ineffective breathing pattern due to probable smoke inhalation as evidenced by oxygen saturation of 75%, flaring nostrils, use of accessory muscles, and respiratory rate of 28 breaths per minute.

4. Urinary System

Volume of urinary output: 20ml/hr

Specific Gravity: 1001

Socratic Questions that were asked on the urinary system

- Why is this patient presenting with diminished urinary output? (Due to the extent of the patient's burn injuries, there is diminished fluid volume, perfusion of the kidneys, and loss of body fluid result in the kidneys producing less urine than normal).
- How can we interpret the specific gravity of 1001? (This specific gravity means the patient's urine is concentrated).
- How did you arrive at that assertion, please explain your reasoning? (Patient's injuries led to the loss of a large amount of body fluids and less blood volume in circulation → little and concentrated urine produced by the kidney).
- What inference can we draw on the patient fluid status? We can conclude that the patient has:

Fluid volume deficit related to loss of body fluid secondary to burns, as evidenced by decreased urinary output and concentrated urine.

Instructions to the learners

The learners were instructed to do the following as the researcher posed the formulated Socratic questions that led to each nursing diagnosis.

1. Analyse the subjective and objective data that you have collected and explain why each of your observations is the case. Write down assumptions based on the analysis of the patient data. Analyse and verify your assumptions about the patient picture in front of you.

2. Clarify in your learning groups how the subjective data relates to the objective data? Question your group members' assumptions and thinking processes, however maintain fairness and honesty when you do so.
3. Cooperatively we will generate questions related to your discussion so as to get clarity on the information you have about the patient.
4. Individually write down your assumptions about the patient's collected data and discuss them with the learner next to you. Give feedback to the rest of the class. Class will be allowed to ask for justification of your assertions and will also probe for reasons and vice versa with your learning group.
5. Write down justifications of why you have made the said assumptions, and give evidence that support them. Discuss with the learner next to you.
6. What generalisations can you make about the data you have about the patient?
7. Formulate nursing diagnostic statements based on the data you have at hand.

After this activity the learners were requested to give feedback to the class and during this time their peers were encouraged to ask Socratic questions that seek clarity, probe assumptions, reasoning, and evidence.

Furthermore they asked questions that probe implications and consequences, and questions about viewpoints or perspectives regarding the patient. The researcher also asked questions that facilitated the learners' interaction and directed the discussions as the need arose.

Learning Activity 4: To demonstrate the use of argumentation as a basis to facilitate critical thinking.

Aim

The learners should demonstrate the use of argumentation to debate the subjective and objective data collected to arrive at an appropriate nursing care plan.

The nature of the learning context

The researcher created an enabling environment for the learners, which was characterised by respect and trust in each other's opinions. The learners were encouraged to display cognitive willingness to engage in argumentation. They used their foundational, conceptual, procedural, and interdisciplinary knowledge to draw from during argumentation.

The environment of advocacy, democracy, and open-mindedness were encouraged so as to facilitate argumentation. The context of argument developed from the convergence of the learner as an arguer, the questions asked, or the need to solve a problem with fellow learners as audience, and educator as the adjudicator.

The context of argument was characterised by three types of areas, which are social constructs that guided how arguments were produced and evaluated. The learners were briefed on what argumentation is, what it entails, and how it can be used as a methodology to facilitate critical thinking.

The learners were encouraged to rebut, provide a justification of another argument, and produce further evidence in the face of opposition by peers. The researcher characterised argument in terms of its objective, context, reasoning, activities, and goal in relation to the content that is to be learned and facilitating the learners' critical thinking skills. The learners were encouraged to maintain persistence to objectivity, and to thoroughly collect sufficient factual or textual evidence before making a judgment. They were also discouraged from generalisation.

Direction was given to them to use disciplined methods of probing, pausing, and listening critically, and to ponder on issues before responding. Furthermore, during the arguments the researcher encouraged the learners to elaborate and strengthen their claims with evidence.

This enabled the researcher to observe, identify, and analyse the nature of the interaction and cognitive engagement between the learners. Table 6.4 represents the lesson plan to meet the fourth learning outcome.

TABLE 6.4: Lesson plan to demonstrate the use of argumentation by debating the subjective and objective data in order to arrive at an appropriate nursing care plan.

Subject Area	Fundamental Nursing Science - Module 1 (Emergency Nursing Care)
Level	1st Year
Content	Asphyxia and pulmonary oedema in burns
Methodology	Argumentation/ Debate
Learning Outcome	At the end of the lesson the learners should be able to: - Demonstrate the use of argumentation by debating the subjective and objective data in order to arrive at an appropriate nursing care plan.
Preparation	<ul style="list-style-type: none"> • The learners pre-read about the nursing care of a patient with burns and asphyxia. • Create an enabling learning environment that will foster an atmosphere of debate characterised by respect and trust in the opinions of others. • Encourage the learners to draw from foundational, conceptual, interdisciplinary, and procedural knowledge during argumentation. • Ensure a learning environment of advocacy, democracy, and open-mindedness that allows for argumentation. • Define the rules of engagement and resolution for the smooth running of the session.
Procedure	Learners pre-read the case scenario related to this lesson plan as outlined below and textbook to gather information.

- Class divided into group A and B.

Scenario 4

Mr Lilydale, a 48-year-old male patient, is admitted to your unit with 54% chemical burns to the face, chest, and back. He works at a chemical factory where a cylinder with a chemical substance exploded. His lungs and heart may have been affected. Mr Lilydale is awake and is able to communicate. He tells you that there was a lot of smoke in the room where he was and that he lay there for some time before he got help.

On observation you notice that he has difficulty breathing, appears to be breathing very fast, and has noisy/gurgling breath sounds. His nostrils are flaring and he is using accessory muscles of breathing. He is anxious, restless, and frothing at the mouth. You further observe that he is cyanosed and that capillary refill is slow. He is restless and anxious. His skin is cold and clammy, with a lot of serious fluid oozing from his wounds. To verify the data collected through observation, you decided to monitor vital signs, blood pressure, measure oxygen saturation, and do a urine analysis. Following are your findings.

Findings: Vital signs

1. Heat Regulation

Temperature: 35° Celsius

Cold and clammy skin

2. Cardiovascular System

Pulse : 120 beats/minute, regular and weak

Blood Pressure: 85/50mmHg

3. Respiratory System

Respiration: 28 breaths/minute

Tachypnoea

Hyperventilation

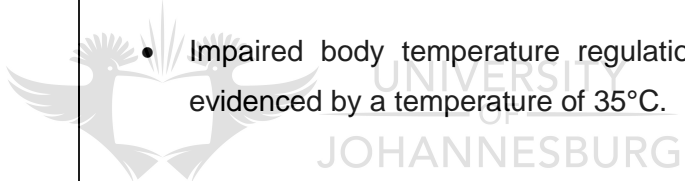
Oxygen saturation: 75%

4. Urinary System

Volume of urinary output: 20ml/hr

Specific Gravity: 1001

NURSING DIAGNOSES/DIAGNOSTIC STATEMENTS

- 
- Impaired body temperature regulation related to burns as evidenced by a temperature of 35°C.
 - Ineffective breathing pattern due to probable smoke inhalation as evidenced by oxygen saturation of 75%, flaring nostrils, use of accessory muscles and respiratory rate of 28 breaths per minute.
 - Ineffective tissue perfusion related to low blood pressure as evidenced by a cold and clammy skin, rapid pulse rate, and decreased urinary output.
 - Fluid volume deficit related to loss of body fluid secondary to burns, as evidenced by decreased urinary output and concentrated urine.

Instructions to the learners

1. Carefully read and critically analyse the paper case scenario as given above and debate the nursing diagnosis given below to demonstrate how you arrived at a nursing care plan based on the collected subjective and objective data. Your arguments should culminate into a nursing care plan.

“Ineffective breathing pattern due to probable smoke inhalation as evidenced by difficulty in breathing, cyanosis, oxygen saturation of 75%, flaring of nostrils and use of accessory muscles of respiration”.

2. Using your views work together with the members of your group to produce the best argument.
3. Analyse the construction of arguments brought forth during the debate: identify the premises and evaluate whether the supporting conclusions are true.
4. Identify flaws in your observations, inferences, and opinions, and those of your peers so as to be aware of the evidence in your argumentation. Provide evidence for your claims.
5. Evaluate whether arguments brought forth are strong or weak.
6. Examine the logical structure of each argument.
7. Evaluate the arguments for clarity, depth, logic, completeness, consistency, relevance, breadth, and accuracy.
8. Formulate a nursing care plan for each nursing diagnoses.
9. Debate the appropriateness, completeness and relevance of each care plan in your learning groups.

The nursing care plan that you will formulate after your argumentation should address the following goal and expected outcome:

Goal: Maintenance of a patent airway and restoration of a normal breathing pattern.

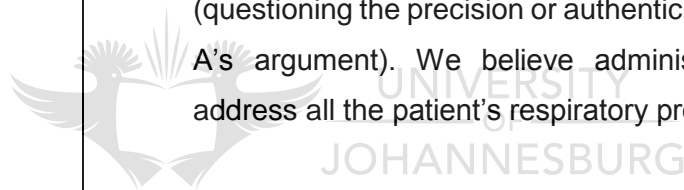
Expected Outcomes: Patent airway, respiratory rate between 12-20 breaths/ minute, respiratory pattern normal, oxygen saturation of 96% and above, absence of dyspnoea, not using accessory muscles and normal skin colour.

Group A started the debate.

- Group A: Our argument is that it is important to ensure that the patient's breathing is eased, therefore the first step would be to put him in Fowler's position depending on the blood pressure.
- Group B in response: Yes we need to nurse the patient in a Fowler's position as you say, but how is that going to alleviate his ineffective breathing pattern?
- Group A counter arguing: We argue that the patient is presenting with a respiratory rate of 28 breaths/minute, difficulty in breathing, flaring of nostrils, use of accessory muscles, cyanosis and oxygen saturation of 75% which are signs and symptoms in keeping with poor tissue perfusion brought about by an ineffective breathing pattern, therefore nursing him in Fowler's position will help to maximise the oxygen intake by expansion of the lungs (**strong argument**).
- Group B: - We are not sure if your argument bears or relates to the patient under discussion and if there is a close logical relationship between your arguments (questioning relevance).

Therefore, our view is that we do not need to nurse the patient in Fowler's position; all we need to do is to give him oxygen to alleviate the ineffective breathing pattern (**weak argument**).

- Group A: We do not understand your claim because you do not give concrete and specific examples (after evaluating the clarity of group B's argument), and that is not all there is that we need to do to address the patient's ineffective breathing pattern (after evaluating to what extent Group B provides complete information). Hence, we do not think you are correct, because putting the Mr Lilydale in Fowler's position first will help ease his breathing, enhance his respiratory effort, and ease his difficulty in breathing for optimum oxygen intake, because giving oxygen through an airway that is not open will not help alleviate the patient's ineffective breathing pattern. Furthermore, we argue that after putting the patient in Fowler's position, we need to clear the airway of any obstruction, like secretions, so that we have a patent airway.
- Group B: We don't agree with your line of reasoning and we are not sure of the authenticity of what you are saying (questioning the precision or authenticity and the logic in Group A's argument). We believe administration of oxygen will address all the patient's respiratory problems.
- Group A: Your argument does not hold, as you are not supporting it with evidence or any justification. It does not address complexities in the questions about the patient's ineffective breathing, which is what we need to address as a matter of priority (evaluating the depth of Group B's argument). It is our belief that a patent airway, free of obstructions, is vital before the administration of oxygen, furthermore our argument is that to ensure a patent airway we need to encourage the patient to cough in order to clear the lungs of secretions that are accumulating, turn the patient from side to side every two hours to mobilise secretions and to prevent hypostatic pneumonia, assist him with deep breathing exercises in order to have full expansion of the lungs, and to stimulate coughing, which will help clear the lungs of secretions and suctioning where necessary.



	<ul style="list-style-type: none">• Group B: But we do not agree that all this will help with oxygenation of the patient. We are not sure if your explanations are making sense? • Group A: We maintain that after putting the patient in Fowler's position, clearing the airway either by suctioning or encouraging the patient to cough and assisting him with deep breathing exercises, then we can administer humidified oxygen to mobilise secretions, only then will Mr Lilydale have optimum oxygen intake because the airway will be patent. • Group B: Well it is only through the administration of oxygen therapy that the patient's breathing pattern will be effective. • Group A: The scope of your argument does not cover all the important aspects of the issue at hand about the nursing care rationales for this patient (questioning the breadth of Group B's argument). Therefore, it is still our argument that we need to implement several interventions and monitor the patient before we can administer oxygen and come to a conclusion that the patient's breathing pattern is normal, viz:<ul style="list-style-type: none">- Nurse the patient in Fowler's position for easier breathing and adequate lung expansion.- Clear the airway by suctioning, encouraging coughing, and assisting with deep breathing exercises to obtain a patent airway.- Move patient from side to side 2 hourly to mobilise secretions.- Administer humidified oxygen therapy as prescribed to compensate for the lack thereof, and to improve tissue perfusion.
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- Group A (continues): After implementing the above interventions, then our further argument is that we also need to monitor the following so as to be able to determine if the patient's breathing pattern is improving or not:
 - Monitor respiratory rate 2-4 hourly based on the patient's condition.
 - Monitor oxygen saturation to detect improvement in tissue perfusion.

The researcher explained to the learners the importance of counter-arguments to an argument or rebuttal that challenged the justification of another argument.

The learners were urged to argue against any item of evidence that is not supportive of the view they are defending.

They were encouraged to use disciplined methods of probing, pausing, listening critically, and pondering.

The learners were encouraged to be persistent enough to objectively and thoroughly collect sufficient factual and textual evidence before bring forth their argument.

The researcher further facilitated the use of counterexamples and counterarguments to rebut assumption, preconceived ideas, fallacies, and generalisations.

The researcher repeatedly and explicitly modelled the cognitive operations necessary for successful argumentation – association, integration, advancing, critiquing, defending claims, generating reasons, supporting reasons with evidence, evaluating reasons, examining opposing sides, and developing reasons in argument.

The learners were allowed time to search for evidence to support their arguments.

The learners were afforded time for silent thinking.

The learners were guided in observing the following principles during their debate:

- Questions or challenges were not to be personal.
- Focus was on the opposing side's position or argument, which helped with formulation of a rebuttal.
- Logic was used to make clear and concise arguments.
- The learners had to be sure of the validity of all the evidence presented for their arguments.
- They had to highlight the important issues that indicated proof of their points, or refute their opponent's argument.
- The learners were directed to identify premises and conclusions in an argument.
- They were guided to identify the conclusion and look at whether or not the premises lead to the conclusion.

The learners followed the same methodology to formulate nursing care plans for all the other nursing diagnoses.

Group A won the debate by providing strong arguments. During the debate the learners used their foundational knowledge of anatomy and physiology, e.g. the respiratory system; conceptual knowledge, e.g. cyanosis, tachypnoea, etc.; interdisciplinary knowledge, e.g. physics in the respiratory process; and used the intellectual standards to evaluate the arguments. Group B lost the debate because their arguments were weak as they were not supported by evidence.

To end the process of argumentation the researcher:

- Acknowledged the learners.
- Demonstrated appreciation.
- De-rolled the learners.

	<ul style="list-style-type: none"> • Discussed outcomes of the argumentation process with the learners. • Outlined the new knowledge gained and the different perspective.
Assessment	<ul style="list-style-type: none"> • Comprehensive learning task assessment and evaluation.

Learning Activity 5: To demonstrate the use of dialectical dialogic reasoning to facilitate critical thinking in ethical decision-making.

Aim

The aim of this learning activity was for the learners to demonstrate the use of dialectical dialogic reasoning in ethical decision-making.

The nature of the learning context.

The researcher explained to the learners what dialectical dialogue is, and what it entails. They were also briefed about the necessary attitude during the dialectical dialogue. The researcher directed the learners to examine issues from multiple perspectives with an aim of highlighting complexities. The learners were urged to explore and interrogate ideas, and to orient their thinking towards the use of the dialectical process of thoughtfully examining issues that bear contradictory truths. The educator guided the learners to identify inconsistencies in others' opinions and viewpoints, in order to gradually attain deeper understanding and insight. Furthermore, the learners were encouraged to elaborate on their discussions with justifications to defend their views, which will lead to improved quality of dialectical dialogic reasoning.

The learners were informed of the importance of fairly and equally considering the challenges and questions raised regarding a particular issue in order to arrive at a better understanding. The educator used concrete examples to raise general issues, while focusing on the conflict between value systems rather than the learners themselves. They were encouraged to carefully think out positions, and to ensure that they were plausible and defensible. The learners were allowed to express emotions accompanying strongly held beliefs, and to minimise the level of mistrust before pursuing practical objectives.

They were further encouraged to connect the generated ideas in order to articulate an informed representation of reality.

TABLE 6.5: Lesson Plan 5: Lesson plan demonstrates the use of dialectical dialogic reasoning to facilitate critical thinking by discussing the ethical decision-making in nursing

Subject Area	Fundamental Nursing Science
Level	1st Year
General Description	Asphyxia and pulmonary oedema in burn patients - Related ethical decision-making process
Methodology	Dialectical dialogic reasoning
Objective	<p>The learners will demonstrate the use of dialectical dialogic reasoning skills to:</p> <p>Discuss the ethical decision-making regarding the “Do Not Resuscitate” instruction from the doctor following the complications that arose due the respiratory arrest of Mr Lilydale.</p>
Preparation	<ul style="list-style-type: none"> • Ensure the learning environment is conducive to the use of dialectical dialogic reasoning skills to facilitate critical thinking. • Brief the learners about what dialectical dialogic reasoning is and the attitude necessary during dialogue. • A non-judgmental learning environment that allowed for a feeling of safety was considered. • Ensure that trust is demonstrated by empathetic listening and dialogue between the learners. • The researcher ensured a learning environment that enhanced the valuing of the individual learner’s integrity, in a manner that welcomed the worth and expression of their true self, without fear of threat or blame. • The learning environment should enhance a culture of intellectual challenge and dialectical dialogue between the educator and learner and between fellow learners.

	<ul style="list-style-type: none"> • The environment to enhance an explicit attitude of information sharing and meaning-making. • The context to allow for interaction that is based on the discussion and predisposition to engage both critically and respectfully.
<p>Procedure</p>	<p>The learners were given the scenario below to critically analyse and thereafter engage in the activities that followed.</p> <p>Case Scenario 5</p> <p>Mr Lilydale’s condition deteriorated. He suffered respiratory arrest due to pulmonary oedema and acute respiratory distress syndrome and was resuscitated on two occasions.</p> <p>His MRI scan reveals that his respiratory tract mucous membranes were burnt during the incident. The patient is comatosed and has a Glasgow Comma Scale of 5/15, pupils are fully dilated and non-responsive, abnormal flexion of the upper limbs and does not localise pain. He is hypoxic and presents with cyanosis, cardiac arrhythmias and severe hypotension, decreased breath sounds and is put on mechanical ventilation. He is anuric, and the doctor says he is in multiple organ failure with brain death. Having been resuscitated on two occasions the doctor writes a “DO NOT RESUSCITATE” instruction on the patient’s clinical records file. Your opinion is that there are ethical decision-making principles that have been violated.</p> <p>Instructions to the learners.</p> <ol style="list-style-type: none"> 1. Read and critically analyse the scenario above. 2. Follow the instructions in the learning task below to discuss the “DO NOT RESUSCITATE” instruction as prescribed through the use of dialectical dialogical reasoning skills. <p>Using the following ethical decision-making principle - non-maleficence and beneficence, justice, veracity and fidelity:</p>

Learning Task 1: The nurse's responsibilities regarding ethical decision-making.

- Engage in dialogue with other learners on the “Do Not Resuscitate” instruction on Mr Lilydale in relation to the “Right to Life”.
- Discuss your feelings with the learner next to you and discuss whether or not you will follow the “Do not resuscitate” instruction. Justify your response.
- Engage in value clarification regarding death, dying, the Living Will, and preservation of life with the learner next to you.
- In your dialectical-dialogue exercise with colleagues analyse the situation in relation to Mr Lilydale and the doctor's instruction, choose a course of action and apply ethical decision-making principles as you explore and clarify your values. Write these down.
- Reflect on what would be the most difficult for you regarding the doctor's instruction and the patient, and give reasons why:
 - Respecting the patient's right to information and right to life?
 - Following the doctor's instruction?
 - Should the patient die, breaking the news to the patient's family?

During the dialectical dialogue between the learners the researcher did the following:

The researcher started the dialogue by commonly held views and ideas on ethical dilemmas related to “the living will”, “euthanasia”, and the “do not resuscitate” instructions in the healthcare setting.

The researcher ensured that dialogue leads to critical reflection among the learners.

Emphasise the learners’ equal status in the discussions.

The learners’ egocentric perspectives were kept in check.

The learners were guided to engage critically but constructively with each other’s ideas.

They were encouraged to continually express their honest point of view.

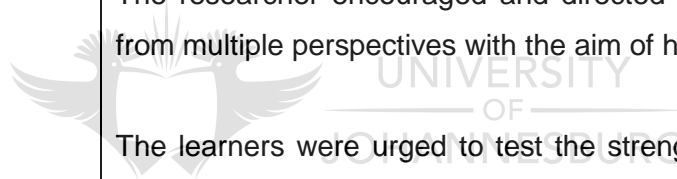
The researcher encouraged and directed them to examine issues from multiple perspectives with the aim of highlighting complexities.

The learners were urged to test the strengths and weaknesses of opposing points of view by using the dialectical process to thoughtfully examine an issue that bears contradictory truths.

The learners used dialogue to analyse the merits of a “DO NOT RESUSCITATE” perspective, using the dialectical manner of reasoning.

Questioning, probing, and careful analysis of ideas by the learners was encouraged.

The learners were guided to identify inconsistencies in other’s opinions and viewpoints by using critical insight to support their own views and point out flaws in self and others’ views on ethical dilemmas



	<p>The learners were directed to connect ideas raised during the discussion.</p> <p>They were allowed to express emotions accompanying strongly held beliefs on ethical dilemmas, to minimise the level of mistrust before pursuing the practical objectives of the issue under discussion.</p> <p>The learners were encouraged to justify their reasons for certain positions on specific issues that related to the “Do not resuscitate” instruction.</p>
Assessment	<ul style="list-style-type: none"> • Writing a persuasive essay on “Legalisation of Euthanasia”.

The researcher used dialectical dialogic reasoning, which involved the use of language and conversation to facilitate the learners’ critical thinking skills. In this instance there was no right or wrong answer, but the objective was to facilitate the learners’ critical thinking.

6.3 EVALUATION OF THE IMPLEMENTED PROGRAMME

The evaluation of the programme was done by way of conducting focus group interviews with the learners that were willing to participate. The purpose of the evaluation was for the learners to give feedback on how they experienced each method that was used to facilitate their critical thinking skills starting with reflection, Socratic questioning, argumentation and lastly dialectical dialogic reasoning. The learners’ experiences are described as such.

6.3.1 The process of evaluation

The process involves the description of how the implementation was carried out considering the population, the sample and sampling method, data collection method, data analysis method and the results of the evaluation.

6.3.1.1 Population

The population consisted of 50 first year learners in the Bachelor of Curationis programme whereby the researcher used the Emergency Nursing Care module for the implementation as prescribed by the South African Nursing Council. The programme was implemented over a term which is equal to 12 academic weeks. The researcher designed the learning outcomes to cover the content using critical thinking methodologies which included reflection, Socratic questioning, argumentation and dialectical dialogic reasoning. These methods were used to facilitate the learners' critical thinking skills using the content that was taught.

6.3.1.2 Sample and sampling method

Evaluation was done after each lesson, the objective being to get the learners to share their experiences while they were still fresh in their minds. A non-probability purposive sample (Burn & Grove, 2009: 355) was drawn from the population of learners. Only the learners who were willing to participate gave feedback. There were 46 learners who volunteered to participate by signing informed consent. Focus groups consisting of 12, 15, 10 and 9 learners respectively in each group were conducted to address the four learning outcomes.

6.3.1.3 Data collection method

The researcher conducted a focus group interview after each lesson. The focus group interviews were conducted in a classroom away from distractions such as noise, ringing telephones etcetera. Each focus group interview (Krueger, 2009: 6) was conducted for a duration of 45- 60 minutes where the learners had to respond to a central question that was asked regarding the different methodologies to facilitate critical thinking. The researcher requested permission to use a tape recorder to record their responses to which they consented and also took field notes. The learners referred to each other as colleague A or B and so on, so as to maintain anonymity. The collected data was kept under lock and key to maintain confidentiality. The researcher sought in-depth information from the learners on how they experienced the implemented programme.

6.3.1.4 Data analysis

Content analysis (Burns & Grove, 2009: 528) was used as a data analysis method. Data was analysed after each focus group that was conducted. The researcher transcribed the responses verbatim before reading through the interviews several times after each focus group. The common words about the learners' experience of each methodology were underlined and extracted and are indicated in the summary for each methodology.

6.3.2 Acquisition of foundational knowledge as a basis for the facilitation of critical thinking

The aim of this learning outcome was to stimulate the learners' pre-requisite foundational knowledge which would form the base of the content that has to be dealt with during the facilitation of their critical thinking. The learners had to label the diagram of the heart and the respiratory system and draw a concept map of the gaseous exchange. Following this learning activity the learners were given the paper case scenario below upon which subsequent learning activities were built using the critical thinking methodologies.

Case Scenario

Mr Lilydale a 48 year old male patient is admitted in your unit with 54% chemical burns involving the face, chest and back. He is working at a chemical factory, where a cylinder with a chemical substance exploded. His lungs and heart may have been affected. Read the instructions below.

6.3.3 Day 1: Use of labelling and drawing a concept map to test foundational knowledge

The learners were asked the following question after the exercise of labelling and drawing a concept map. This was done during day one before asking questions about the use of reflection to facilitate their critical thinking.

- Please tell me your experience of labelling the diagram of the heart and respiratory system and drawing a concept map of the gaseous exchange to facilitate your critical thinking.

The responses of the learners were:

One learner said, *“At first it was difficult to remember the anatomy, but I had to think in order to recall what we learnt in the anatomy class”*.

“Yes I agree and I realised that I would not understand asphyxia and pulmonary oedema without having knowledge of anatomy of the heart and the respiratory system”, added another.

“My challenge was the concept map because if one did not carefully it would be easy to connect the concepts wrongly, which would change the meaning of your whole concept map. And that took some thinking,” said another.

Another learner said, *“I found this type the labelling and drawing of the concept map very interesting as it forces you to think critically. I think we should do more of these”*.

The activity was given to the learners to test their foundational knowledge. The aim was to enable the learners to retrieve their existing schema of anatomy which would be used as a precursor to construct new knowledge.

6.3.4 Reflection

Following the implementation of reflection as a methodology to facilitate the learners' critical thinking skills, the following question was asked the participating learners:

- Please tell me your experience of the use of reflection as a method to facilitate your critical thinking skills in the implemented programme?

Probing was done to collect in-depth experiences of the learners of the implemented programme until data was saturated. The learners cited the following with regard to the use of reflection to facilitate their critical thinking skills. The methodology used to facilitate the learners' critical thinking skills required that the learners work mostly in groups.

It is in a group where there will be dialogue among the learners. A class where critical thinking is facilitated is not a quiet class as there is a lot of discussion and conversation among the learners and between the educator and the learners.

This was confirmed by one learner whose response was, *"I particularly enjoyed working in a group wherein there were different opinions from my colleagues and I realised that there is no one answer to a question."*

Another learner added that, *"It was fun, interesting and enlightening especially listening to different opinions when we were asked to share our reflections. What was your experience of the first activity?"* the researcher asked.

The researcher observed the learners as they engaged in dialogue and clarified the question when the learners seemed not sure while encouraging them to reflect.

One learner said, *"At first it was difficult for me to reflect on what we learned in anatomy and physiology because I had to think really hard to remember especially the gaseous exchange, however, working with others and being encouraged to discuss issues amongst ourselves made me think, and as my group mates challenged my thinking, I was forced to evaluate my thinking and how I arrived at a conclusion."*

"I agree the activity made me realise that I do not have much knowledge to be able to do the activity and that I needed to search for information. I had this uncomfortable feeling in me when you gave us that diagram to label and drawing of the concept map. It was difficult to reflect," added another learner (frowning).

"What was difficult, the process of reflection itself or reflecting on the anatomy and physiology?" asked the researcher."

“Reflection because during reflection I had to think deeply about what I have already learnt and the information at hand and when ideas came up I had to analyse them first and evaluate them to see if they are relevant to the question, but I know now that reflection forced us to think critically”, responded the learner.

Another one added, *“In the beginning I was shy to share my reflections with the group and I relaxed when you encouraged us to think ma’am. I then began to enjoy working in a group, because you get to listen to others’ points of view, which forced me to reconsider my own point of view and that helped me to identify mistakes in my own thinking”.*

One learner said, *“It is difficult to question your own thought processes and recognise your own assumptions unless you use others as a mirror to reflect things to you, so it was good that we were given time to share our reflections with others although it was difficult at first.”* *“I think another thing that was good is that sharing your reflections with others helped us with building up knowledge together”,* added another learner.

Did the reflective process make you to think?, the researcher asked.

“Yes the questions forced us to think and I realised during reflection one has to use knowledge from anatomy and physiology, knowledge I already have to be able to build new knowledge”, said one learner.

One of the learners said, *“During the learning activities I had to think critically in order to answer the question that was asked and relate it back to a previous lesson and this made me think deeply and critically on what was involved”.*

The researcher asked a further question, *“If you reflect once more on the lesson what other experiences did you have that facilitated your critical thinking skills?”*

One of the learners said, *“I think using reflection as a method to facilitate our critical thinking helped me to gather information, evaluate and organise it, become aware of different interpretations of the said information and evidence and also to test my thinking and correct myself.”*

“I think reflection must be used more because it stimulates your critical thinking,” added another (happily). “I liked it when you encouraged us to continually reflect on our motivations, values and attitudes because that actually taught me to be unbiased and fair to others and their inputs,” remarked another.

The researcher ensured that the learners learn to systematically collect, record and analyse their thoughts and observations and offered them a framework for reflection using the prescribed content to facilitate their critical thinking skills.

In summary the learners experienced the use of analysis, evaluation of their own thinking processes and those of others, knowledge construction, thinking deeply and critical listening from the use of reflection to facilitate critical thinking as evidenced by their responses to the questions asked.

6.3.5 Day 2: Socratic questioning

Questioning is a corner stone of critical thinking. A critical thinker maintains a sceptical mind and is always questioning. Nothing is taken for granted, therefore the learners were asked questions about their thinking and probed for clarity and justification.

Socratic questioning was used with the infusion of content to facilitate the learners’ critical thinking. The learners were asked this central question:

- Please tell me your experience of the use of questioning to arrive at an answer as a method to facilitate your critical thinking skills in the implemented programme?

“The lesson and method used to teach made me to look at the “bigger picture” of things, to think out of the box you know”, said one learner (waving hands).

“Ja we were required to go deeper into the issues under discussion about formulating nursing diagnoses for Mr Lilydale and in that, one had to think critically and could not just readily answer”, cited another learner supporting the other.

“Ma’am being asked questions continuously when we gave answers made me uncomfortable as I initially thought you did not like the answers that I gave and I thought to myself I have answered her what more does she want?”, said one learner.

Another learner said, *“It was very uncomfortable ma’am when you asked a question and kept quiet because there would be this deathly uncomfortable silence in class that made one even doubt the answer they have.”*

Do you still feel uncomfortable? asked the researcher.

“No I now know that the questions were meant to make us think and not to just accept things at face value” the learner said in response.

So you are saying you would not accept things at face value, so what are those things?

“If we just accepted that Mr Lilydale has hypothermia and you did not ask further questions that made us think critically and look for justifications why we concluded that the patient had hypothermia, we would have ended up with a superficial answers without really thinking about how did it come about”, added another (excitedly).

About this aspect one learner said (agreeing), *“I liked the fact that we were not shut down, each person was given an opportunity to give their opinion and the questions that were asked challenged our thinking and we were forced to think critically.”*

What I hear you say is you do not like being shut down, but how did the questioning make you feel? The researcher observed that some questions would unsettle the learners, which made them realise that there are knowledge gaps that they needed to bridge.

“Ma’am it was the questions that were challenging, I had to think hard because you kept on asking questions even when you were given answers, at first I thought but the question has been answered, but later on I realised that there is more than one answer to a question and that I cannot always be right. It was fun”, said another learner (smiling).

“That is interesting, you seem to have enjoyed the lesson”, remarked the researcher also smiling. The cognitive discomfort created prompted the learners to search for information

by searching literature for an example textbooks, a journal article etcetera and also discuss with their peers, as one learner said,

“The questions that were asked were sometimes difficult and challenging but what I liked is that we were given an opportunity to thinking about the answers.”

Another learner added, *“You know ma’am when you are shut down you feel stupid and you stop thinking. However I liked the way you asked the questions, you allowed us time to think by keeping quiet though uncomfortable, yes they made us realise that we lack some information for us to be able to answer some of the questions and that forced us to search for more information and not just search but also to think critically about the new found information”*.

Gentle probing and gently nudging was vital. The learners’ thinking skills were questioned in a manner that was psychologically safe and non-threatening. Their self-esteem was maintained at all times even where their responses and reasoning were incorrect, corrections were done through further questioning without ridicule.

This was evidenced by one learner who said, *“I enjoyed the way you redirected our thinking through questioning when we went off at a tangent, without making us feel stupid.”* *“Yes I liked the way you responded to our answers ma’am. You did not make us feel stupid, and everyone’s opinion was taken into consideration.”*

“Even when we said something irrelevant you brought us back to the topic without ridiculing us. So I felt comfortable in saying what I thought without the fear that I will be made to feel stupid”, added another learner in agreement (nodding head).

Another learner added that, *“this lesson made me realise that when you ask further questions based on the initial question it makes one think because when you kept on saying “why” you were actually directing us to think critically.”*

In summary the learners' responses pointed to the fact that Socratic questioning was appropriate for the facilitation of their critical thinking as the analysis of the data came up with words such as "bigger picture", go deeper, justification, realising the value of knowledge and new found information.

These words were an indication that the use of Socratic questioning made the learners realise that they had knowledge gaps in some aspects of the content which forced them to think critically about how to bridge it and construct new knowledge. They also said they had to "go deeper" into issues which means they thought deeply and critically about issues at hand. They also had to justify their answers which brought to light that they have to justify their claims and arguments and not take issues at face value.

6.3.6 Day 3: Argumentation

During the lesson that used argumentation as a method the researcher divided the learners into group A and group B after which they were given a topic related to Mr Lilydale's ineffective breathing pattern and the nursing care thereof to debate. A central question to get feedback on how they experienced argumentation as a method to facilitate their critical thinking skills was asked. The question that was asked was:

- Please tell me your experience of the use of argumentation as a method to facilitate your critical thinking skills in the implemented programme?

The researcher encouraged disciplined methods of probing, pausing, listening and listening critically. Argumentation required that the learner demonstrate intellectual humility in accepting flaws in their thinking and argumentation and intellectual perseverance in seeking evidence and justification in counter-arguments.

In response to the question that was asked in relation to argumentation one learner said,

"Yes I liked the debates and arguments because they were fun and I think we should be given more of this kind of teaching (debate, argument) because it forces us to learn to search for information as I realised that there is no one answer to any question and one had to give evidence for their claims."

Did the debate about Mr Lilydale's ineffective breathing pattern stimulate your critical thinking during the argumentation?

"Yes it did and I realised that one cannot argue for the sake of arguing and that before bringing up a counter-argument you need first to evaluate the argument at hand whether it is a strong or weak argument, then assess for clarity, completeness, relevance and so on before making a judgment," added another learner.

One learner asserted that, *"the arguments gave me an opportunity to say what I think, what I believe in and justify why I maintained such a view while my fellow learners were allowed to assess them"*.

I observed that during the debate some of you were getting agitated by the arguments from the other group, said the researcher.

"It's true ma'am some of us got upset but I learned that as a critical thinker you keep an open mind because your reasoning may be wrong and the arguments of the others may be correct which may require you to adapt or change your point of view or opinion," responded one of the learners (gesticulating).

Another learner said, *"Personally I realised that to solve a problem I have to think carefully and deeply and collect evidence to support my claims which may be wrong, so I had to listen critically to the arguments of others so that should I be required to change my view I do so"*.

"Yes you were asked to carefully explore and analyse the issue and give justification and evidence but also had to be sceptical about the arguments from the opposition before you accept their point of view," asserted another.

It was important for the educator to have the learners realise that to argue for one point of view or the other and to think how to provide evidence that support their beliefs required that their critical thinking skills be facilitated.

The researcher guided the learners to support the ideas brought forth with evidence, logical reason and extrapolation from Mr Lilydale's situation as to how they would act should they come across a patient with similar clinical manifestations, analyse and synthesise the collected data and make interdisciplinary connections.

Was it important to support your arguments with evidence? asked the researcher.

One of the learners response was, *"I realised that you cannot just make a claim without saying the reason why you think that is the issue, when the teacher asked "why" and "where" do you get that from, at first I felt uncomfortable, but I later realised that you are forced to think critically to be able to justify your claim.*

"I also realised that in critical thinking you don't just make claims without giving evidence, which means it is important to question issues and not to take everything at face value. I learned that a critical thinker is always sceptical and knows that there is always two sides to a story and that one may be wrong in their thinking", remarked another (frowning).

"For me hearing responses from others made me realise that there are different ways of looking at an issue and this challenged my views and beliefs and it made me to think more critically."

Another learner said in agreement, *"It dawned to me that the more wider the perspective on how I perceive an issue or situation the more I am influenced and the more I develop my own attitude and beliefs. The arguments influenced my thinking skills and sometimes I had to change my perception",* added another.

The learners were made aware that disagreements had to be objective and they were encouraged to carefully look for flaws in whatever evidence that was before them during the argumentation.

One learner was of the view that, *" I learned that I have to make my explanation clear as at times it is hard to understand what others say if it is not said in a clear manner".*

“One thing that I found to be a bit difficult was to evaluate whether the claim is clear, whether it is relevant or if sufficient information is given, the relevance of the warrant and whether exceptions have been taken into account in drawing conclusions and whether counterarguments have been presented”, said one learner.

The learners’ thinking and arguments were directed in a manner that compelled them to provide evidence for their claims. Questions that probed assumptions were posed to them.

The researcher assessed whether the learners are able to analyse data and effectively consider all points of view, and if they have completely synthesised the information they have. Furthermore the assessment was to see if they were able to use different options in trying to solve the problem, and if they were aware of their own assumptions and how these would impact on their problem-solving and decision-making. Questioning enhanced the learners’ critical thinking skills. The questions were formulated to act as argument prompts to encourage learners to make decision and to articulate reasons for their decisions. After listening to conflicting viewpoints each group presented their care plan to the whole class, thus learning how to make active interpretation, examine their arguments for possible bias and put forth clear and logical arguments to support their opinions in the face of strong opposition.

One of the learners said, *“The argumentation activities made me to look at issues, weigh them and come to an understanding where my colleagues are coming from and their different points of view”.*

“The debates in class helped me to learn new knowledge. I also felt confident in presenting my point of view and it helped me to think critically although it was quite challenging”, remarked another.

The educator observed the learners during the debate to see whether they were able to work in teams as critical thinking has an element of collaboration. They were further assessed if they were able to analyse arguments which improved their ability to think critically.

This made allowance for collaborative use of persuasive evidence and engagement in the use of critical thinking skills to solve problems, communication and presentation.

The learners were afforded an opportunity to compare their newly acquired conceptual knowledge with their foundational knowledge and integrate both knowledge into new conceptual frameworks.

Critical thinkers are open-minded. The researcher continuously reminded the learners that they should tolerate other peoples' opinions and learning not to "jump to conclusion", while at the same time maintaining a healthy scepticism.

In agreement one of the learners said, *"I used to look at issues from one side which is the way I see them. In argument I would make sure that the last word is mine and that I win."*

"In this programme I have come to realise that it is important to listen to other peoples' opinions and to look at a situation from different perspectives because it is not about who wins the debate," said another.

Does this mean you had to be tolerant of diverse opinions, asked the researcher?

One other learner said, *"Of course I have learnt that one must always maintain an open mind. The group made me realise that I cannot always be right and that I should learn to identify gaps in my knowledge and learn from my mistakes."*

"I also learnt that I cannot be biased when evaluating arguments," added another one.

One of the learners added that *"the debate provided us with excellent chances to find various opinions and understand their differences, thus yielding better conclusions". "I found that it was good to listen because one had to listen critically and share ideas which I use never to do before. There is a sense of achievement that I gained from refuting the ideas of the opposite side in a debate. It was also interesting to consider different perspectives and to identify upcoming ideas,"* added another learner in agreement (nodding head).

One learner said, *“I particularly enjoyed the debates and arguments. I think my critical thinking skills have improved because we had to assess and analyse the arguments of the two teams, engage in research as we all had to research the topic, collect data and question our assumptions and cooperate with others in the team”*.

Am I correct to say you enjoyed working in a team? enquired the researcher.

This learner was supported by another learner who said, *“I agree, the debate helped me to understand the nursing of Mr Lilydale better and the rationale behind the decisions made, learn new knowledge and my critical thinking skills were enhanced”*.

“The debate was interesting. I initially wanted to fit into one group but I found all arguments very good and forcing me to think critically, I think we should be given more of debates as it enables us to think critically and to research and read more”, added another.

Their critical thinking skills were facilitated in that during the debate as they presented their arguments they had to use the cognitive skills to think critically and use skills such as critical listening, problem solving, inductive and deductive reasoning, questioning and communication.

Another learner asserted that, *“the debate activity motivated us to engage in critical reasoning which allowed our fellow learners to generate explanations as well as being sensitive to their own assumptions and those of the other learners.”*

This implies an application of the reasoning process as well as showing how these processes influence justification of the issue that is being debated. The learner were encouraged to say why they supported or opposed certain perspectives while indicating their ability to argue and make decisions based on reasoned evaluation. Provocative technique directed towards the learners to examine the grounds of their assumptions, which led them to the formulation of solid rational arguments and conclusions with logical foundation was used.

One learner said, *“Debating the story of Mr Lilydale was interesting and improved our critical thinking. It was a meaningful experience where we also learned how to formulate persuasive ideas without offending others. The group perspective helped me learn how to organize, synthesise and negotiate different ideas”*.

During the debate the learners learned how to listen actively and effectively take note. They learned to concentrate on what is being said and take mental notes effectively.

Another learner said *“group debate is good because we work together to discuss issues and write responses, unlike working individually, peer discussion facilitate effective learning”*. Debate encouraged us to listen and to be tolerant of different ideas”, said another in agreement.

The debate encouraged the learners to base their reasoning on well-rounded perspectives.

“Yes I also realises that if you are going to argue you have to be able to listen critically in order to know what other people are saying”, added another.

Another learner said, *“For some of us who are shy, working in groups motivated us to express ourselves and listen to others, as the teacher encouraged us to become actively involved in the discussion. All the group members were confident in expressing their ideas, and we learnt to present well thought out arguments. The activities also gave us an opportunity to think deeply and critically”*.

One of the learners said, *“I was initially shy to express my views but when I saw other talking I overcame my nerves and started talking which was not bad at all, as our group began very noisily because we were disorganised but we later started expressing our ideas and almost everyone in the class became involved in the class discussion.*

In summary the debate promoted self-evaluation, consideration of alternatives, in-depth analysis of situations from multiple perspectives and synthesis from different viewpoints. The learners demonstrate their ability to translate information, classify it and compare it with other available information and infer generalisation about the exclusive nature of a particular phenomenon or concept as demonstrated by words such as justification, evidence, critical reasoning, scepticism, open-mindedness, organise, synthesise and tolerance of different ideas, assess and analyse the arguments, cooperate, justify, evidence and think deeply and critically that were identified from the learners' responses during the analysis of the data from the focus groups. The objective was to develop the learners' ability to analyse and interpret information, generate explanations, draw logical and evaluative inferences using their inductive and deductive reasoning skills.

Furthermore the learners were expected to attempt to persuade or convince their peers to express doubts, ask questions, to relate alternate views and point out what is not known. This is where the value of argument was brought to light. The learners seemed to enjoy expressing their views. They listened to each other and did not tend to talk over or interrupt each other. There was a constant dialogue between the learners and the researcher.



The researcher kept reflective notes whereby the learners were assessed whether they were able to analyse and evaluate their thinking with a view of improving it, they were directed to use intellectual standards to assess for clarity, determining whether a statement is clear, determining whether the statement was accurate or relevant; precision, determining the specificity of the statement; relevance, determining connection to the problem or issue; depth, determining the complexities of the situation; breadth, considering multiple points of view; and logic, determining if a statement makes sense.

The interesting thing during the debates is that the learners responded constructively to both agreeing and disagreeing claims. They seemed to organize their conceptual knowledge construction by organizing knowledge, synthesizing ideas and relating them to the issue under discussion. During this process the researcher encouraged them to eliminate their personal prejudice from the discussion. Some learners had a tendency to speak their own view without responding to the opinion of others and the researcher had to be vigilant of those and bring them back to the discussion.

The learners gradually learned that it is important to explain their views clearly and provide solid evidence and examples and use evidence to convince others. The argumentation and classroom debates improved learner involvement, stimulated interaction among student and encouraged critical thinking.

6.3.7 Day 4: Dialectical dialogic reasoning

The researcher integrated the content on ethical decision-making and ethical dilemmas into dialectical dialogic reasoning which is one of the methods that were used to facilitate the learners' critical thinking. The learners were asked the following central question:

- Please tell me your experience of the use of dialogue as a method to facilitate your critical thinking skills in the implemented programme?

The learners were directed to use dialectical dialogical interpretation when different perspectives were being examined with the aim of reaching an agreement on acceptable claims or courses of action.

The learners enjoyed working in groups as evidenced by one who said, *“Working with others was interesting and I became aware of different ethical dilemmas we might come across in practice and the different decisions we might have to take in such situations (paused), thinking about all these things, really stretched my mind”*.

Another learner added, *“Of course it was challenging, I did not know what to do where you had to choose between the doctor and the patient”*.

What do you mean by stretched your mind?

“You see ma’am when your mind is stretched is when you are forced to think critically about an issue under discussion. You think deeply and widely in order to have an understanding while keeping openness about what others say as you may be wrong and may need to change your thinking”, said one learner.

The objective here was to develop the learners' ability to define a problem, select pertinent information for the solution of a problem, recognise stated and unstated assumptions, formulate a plan of action, and draw valid conclusions as well as judge the validity of inferences. Initially the learners had to gather information about the problem and generate resolutions. Following that they had to formulate the resolutions which includes intellectual refinement of the problem and further development of problem resolutions. The next step was to formulate a plan of action, incorporation and carefully examining the problem and developing solutions. Finally the learners engaged in reasoning which involves analysing and synthesizing the various components of the problem and the potential solutions.

Critical thinking involves a dialogue. It requires that the critical thinker tests their opinions, claims and arguments against those of others as they may be wrong.

One of the learners asserted that: *"I was glad we had to give our opinions and they were taken seriously, that made me feel valued and I was prepared to engage in critical thinking;"* said one learner.

"The contributions from others made me see things from a different perspective and I realised that I must always be receptive to the opinions of others;" added another.

"I realised that we were thinking from different angles which made the lesson meaningful for me and I enjoyed that, however I saw that in ethical decision-making one has to be a critical thinker in order to come up with correct decisions," said one learner.

The learners enjoyed working together and conversing with each other as evidenced by a response from one of the learners,

"It was nice to hear different opinions, it made me to think a lot," said one learner. *"This was fun. I got to see other people in another level, how they think, if they were open to other people's ideas and whether they were ready to adapt their ideas,"* added another (laughing).

“Decision making on the “DO NOT RESUSCITATE” issue was not easy I had to think on how to present my opinion in order to see if the others see things the way I do. So to do this I had to come up with a strong justification that is supported by evidence. I think we should be taught like this more often because as you learn your critical thinking skills are also improved,” said another.

In summary the use of dialectical dialogic reasoning as a method to facilitate the learners’ critical thinking skills enabled the learners to demonstrate their understanding of the worth of the information, evidence, ideas or meaning that has been developed during the exercises.

This was evidenced by the identification of words/phrases such as forced to think critically, receptiveness, openness, justification and evidence during the content analysis of the focus group interviews. The learners displayed honesty and objectivity in findings which may not support personal self-interest or preconceived opinion by modifying or negating previous ideas.

The researcher had to consider tolerance of divergent views and sensitivity to possible personal bias by the learners. The learners demonstrated that they valued the application of reason for resolving problems. They demonstrated the application of organised, orderly, focused and diligent thinking processes during the inquiry process.

6.4 IMPLICATION

Facilitation of critical thinking skills in nursing education is an essential requirement. The facilitation of critical thinking skills in the learners require educators to integrate critical thinking skills methodologies in the existing programmes which help them to focus on the stimulation of higher order thinking in learners.

The educators should use a variety of teaching and assessment methods that will facilitate the development of critical thinking skills in learners. Such methodologies should foster argumentation, reflection, Socratic questioning and dialectical dialogic reasoning among others. There should be innovation and creativity in using critical thinking methodologies in the facilitation of critical thinking in nursing education.

The use of these methodologies within the content should be such that the knowledge of learners is expanded, their critical thinking skills are facilitated, they develop the attitudes necessary for such thinking and become self-directed lifelong learners. Integration of critical thinking in nursing programmes will liberate the minds of the learners and free them from ignorance that is characterised by self-centredness, from narrow self-interest and small mindedness to become critical thinkers.

6.5 SUMMARY

This chapter involved the description of the implementation and evaluation of the programme. The programme was implemented in a class of first year BCur learners and focus group interviews were conducted to obtain feedback on how the learners experienced the programme. The outcome was that the learners learned how to analyse, evaluate their own thinking processes, listen critically, look into the “bigger picture”, justify, reason critically, be sceptical, draw logical inferences and consider multiple points of view among other critical thinking skills. The study’s original contribution, justification, limitations recommendations, and conclusion are described in chapter seven.



CHAPTER 7

ORIGINAL CONTRIBUTION, JUSTIFICATION, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

7.1 INTRODUCTION

The purpose of this chapter is to describe the original contribution made by the study to the body of knowledge in nursing education, justification, limitations, and recommendations of the study with regard to nursing education, nursing practice, research and conclusion.

7.2 ORIGINAL CONTRIBUTION

Nurse educators have been facing a challenge of facilitating critical thinking in nurse learners. Critical thinking in nursing plays a large role in assuring patient safety. The development, implementation and evaluation of a programme to facilitate critical thinking in nursing education was necessary. The developed programme will assist the nurse educator to facilitate critical thinking as a critical cross-field outcome of all education programmes in South Africa as a requirement by the South African Qualifications Authority Act (Act 58 of 1995) and the South African Nursing Council. The product of this programme will be a practitioner who is a critical thinker and one who will use these skills in decision-making and problem solving in practice. The nurse graduates who have been through this programme will be able to formulate workable solutions to complex problems and deliberate about the course of action to be taken in patient instances they will face in practice. This research is an original contribution to the body of knowledge in nursing education in the following manner:

- To develop this unique programme the researcher departed from a scientifically formulated conceptual framework of critical thinking that came up from a Delphi technique that was undertaken by a group of proponents of critical thinking and their recommendation for prospective researchers to develop critical thinking educational programmes (Facione, 1990).

Facione and others undertook a Delphi technique which came up with the definition of critical thinking as a purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations on which judgment is based (Facione, 1990: 2).

- The frameworks of Bevis (1989), Beyer (1988) and Caffarella (2002) were used to derive an integrated curriculum framework that was used to direct the development of the programme. The framework of Dickoff, James and Wiedenbach elements of practice theory (1968) was used to conceptualise the empirical findings to develop a programme to facilitate critical thinking in nursing education.
- From the conceptualisation of the empirical findings the researcher further developed a conceptual framework on which the process to facilitate critical thinking skills using the content of the programme was described.
- The programme was implemented by developing five learning outcomes to cover the content of Basic Emergency Nursing Care using four critical thinking methodologies over a period of 12 weeks. The implementation was followed by evaluation through immediate feedback from the learners who volunteered to participate in focus group interviews.

7.3 JUSTIFICATION

The purpose of this study was to develop, implement and evaluate a programme to facilitate the critical thinking of learners in nursing education. This purpose was attained through the following objectives:

Phase 1

7.3.1 Objective 1: To explore and describe the perceptions of nurse educators on how to facilitate critical thinking using the critical thinking framework in nursing education.

This study was a qualitative, exploratory and descriptive study that was contextual in nature. To achieve this objective the researcher interviewed a purposively selected sample of nine nurse educators on how to facilitate critical thinking using the critical thinking framework (Facione, 1990). The perceptions of the nurse educators on how critical thinking can be facilitated using the critical thinking framework in nursing education were explored and described until data saturation by the ninth participant. Data was collected through focus group interviews (Krueger, 2009:6) which were followed by individual interviews to verify the collected data.

A central question on how the critical thinking framework can be used to facilitate critical thinking in nursing education was asked based on the different dimensions of the framework. The dimensions under which the questions were asked were the contextual, conceptual, methodological, evidential and criteriological dimensions of critical thinking. Miles and Huberman's (1994) conception matrices method of qualitative data analysis was used to analyse data and to organise the participants' perceptions in a meaningful manner. The researcher used the framework of Lincoln and Guba (1985) to ensure trustworthiness.

Phase 2

7.3.2 Objective 2: Conceptualisation

Phase two dealt with the conceptualisation of the findings within Dickoff, James and Wiedenbach's elements of practice theory (1968) where the agent (educator), recipient (learner), dynamic, and process/procedure were used.

Phase 3

7.3.3 Objective 3: To develop a programme to facilitate critical thinking in nursing education.

An integrated framework derived from Bevis (1989), Beyer (1988) and Caffarella (2002) informed the steps of programme development while Dickoff, James and Wiedenbach elements of practice theory (1968) were used as a framework within which the programme was developed. Furthermore the researcher formulated a conceptual framework from the process of Dickoff, James and Wiedenbach practice theory elements which was used to direct the process/procedure of the programme.

Phase 4

7.3.4 Objective 4: To describe the implementation and evaluation of the developed programme to facilitate critical thinking in nursing education.

The programme was implemented in a class of 1st year learners in the BCur class. All the learners were requested to participate during the implementation as the content that was taught was part of their academic year. The learners gave informed consent. The prescribed content on Basic Emergency Nursing Care was used to implement the programme. The programme was implemented over a term (12 academic weeks). After the implementation the programme was evaluated by the learners who volunteered to participate in the evaluation of the programme by giving signed consent.

Evaluation of the programme was done through focus group interviews of the learners who volunteered to participate in the evaluation after the implementation of the programme. The learners gave informed written consent. The main purpose of this evaluation was to get feedback of how the learners experienced the programme. Focus group interviews were conducted on completion of each lesson. The researcher conducted four focus group interviews after each lesson respectively. In-depth information was sought so as to have an understanding of how the learners experienced the programme. The learners were requested to respond to a central question referring to each learning outcome. All the set out objectives were met by this study.

7.4 LIMITATIONS

One of the limitations was that the researcher was the one teaching the learners as their lecturer and this could be viewed as have been open to coercion, how the researcher bracketed their pre-conceived ideas. Be that as it may, had the researcher sought an outside person to implement the programme, it would have impacted on trust on the part of learners and stifle their participation. Secondly, focus group interviews did not give the actual impact of the programme. Furthermore, it is the researcher's opinion that evaluation would have been much effective if the programme had been implemented over one academic year where there would have been an opportunity to do a pre-test and post-test before and after implementing the programme.

7.5 RECOMMENDATIONS

The description of the recommendations regarding the programme will be with reference to nursing education, nursing practice and nursing research respectively.

7.5.1 Nursing Education

The researcher recommends that nurse educators should develop new innovative and creative teaching and assessment methods based on the methodologies described in this programme. As programmes are content-laden, critical thinking may not be taught as a subject on its own but this programme proves critical thinking methodologies may be infused in the content to facilitate critical thinking skills.

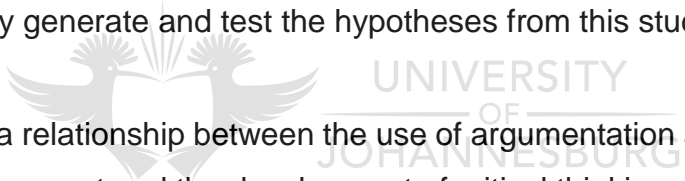
7.5.2 Nursing Practice

To meet the needs in practice it is vital that nursing education programmes should be such that they facilitate the critical thinking skills of the learners. It is through critically thinking practitioners that practice can improve and quality standards maintained. A critically thinking practitioner will be able to practice independence while collaborating with others to meet healthcare needs of patients/clients in complex healthcare settings.

This practitioner will display a spirit of probing inquisitiveness, a keenness of mind, a zealous dedication to reason, and a hunger or eagerness for reliable information, which good critical thinkers possess (Facione, 1990:11).

7.5.3 Nursing Research

It is recommended that this programme be replicated in a class of senior learners over one academic year in order to increase the transferability of the programme to different settings, with some adaptation of content to suit the level of training. The facilitation of critical thinking skills of learners requires that the educators does that in a structured manner, using methodologies that are facilitative of critical thinking, hence there is a need to develop an instrument to test this programme after it is implemented. It is further recommended that future researchers include criteria for searching and give rationale for excluding particular literature. The researcher also recommends that a comparison of exam results of learners who have been exposed to this programme and those who have not be undertaken in order to determine the impact of this programme. Prospective researchers may generate and test the hypotheses from this study for example:

- 
- There is a relationship between the use of argumentation as a method of teaching and assessment and the development of critical thinking skills of nurse learners.
 - The use of Socratic questioning as a method in teaching and assessment is facilitative of critical thinking.

7.6 CONCLUSION

This chapter concludes the study. The programme was developed in a manner that allows it to be applied in any educational setting to facilitate the critical thinking skills of learners. Therefore prospective researchers and other academics can use this programme in other educational settings followed by research on its validity in nursing education.

It is thus the researcher's belief that this programme is an original contribution to the body of knowledge of nursing education as the programme was developed, implemented and evaluated to demonstrate the infusion of critical thinking skills in the content and provide clear steps for the educator on how to implement the programme, of which the ultimate aim is the production of a critically thinking graduate. The programme will enable nurse educators to use various critical thinking teaching strategies to help learners develop critical thinking skills that are needed for safe nursing care. Multifaceted teaching strategies involving shared power and questioning will help move the learners out of their comfort zone (Vygotsky, 1978).



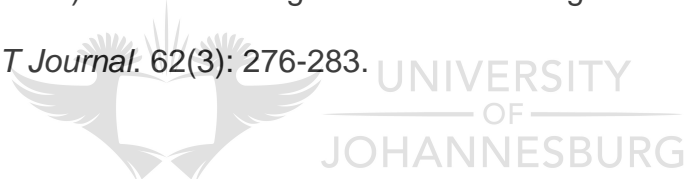
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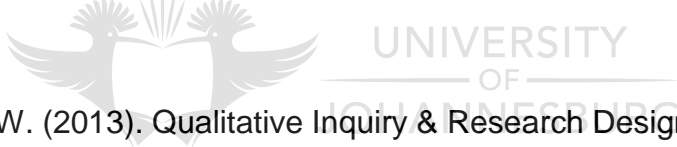
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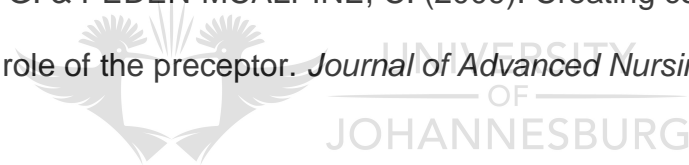
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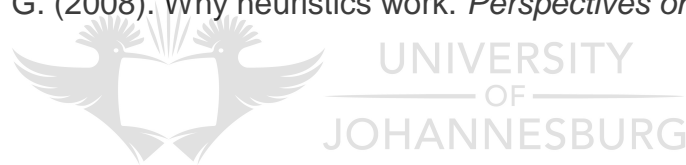
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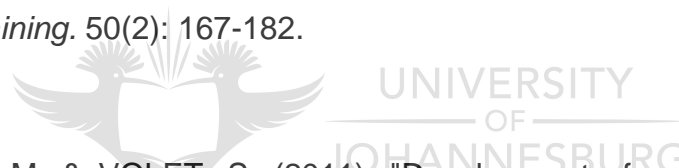
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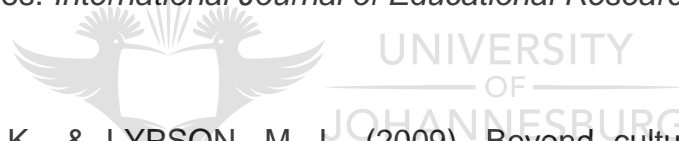
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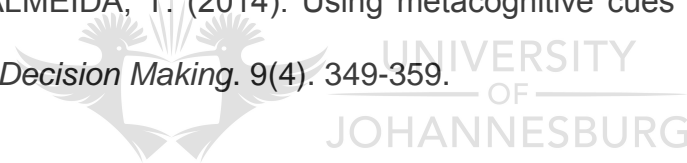
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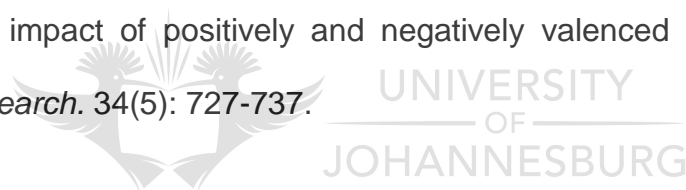
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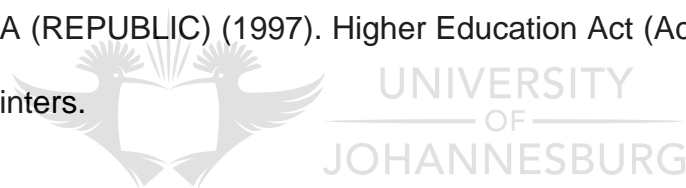
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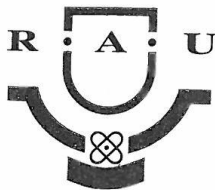
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RANDSE AFRIKAANSE UNIVERSITEIT
Posbus 524, Auckland Park 2006
Republiek van Suid-Afrika
Tel (011) 489 2911
+ 27 - 11 - 489 2911



RAND AFRIKAANS UNIVERSITY
PO Box 524, Auckland Park 2006
Republic of South Africa
Fax (011) 489 2191
+ 27 - 11 - 489 2191

DEPARTMENT OF NURSING SCIENCE

Telephone : (011) 489-2649
Fax : (011) 489-2257

2004-09-20

Reference Number: 35/05/04

TO WHOM IT MAY CONCERN

TITLE OF RESEARCH PROJECT: "Development, operationalisation and evaluation of a programme to facilitate critical thinking of learners in a private Nursing College."

RESEARCHER: Mangena, A.

**SUPERVISORS: Prof. M.M. Chabeli
Dr. E.J. Arries**

The Academic Ethics Committee of the Faculty of Education and Nursing of the Rand Afrikaans University evaluated the research proposal and consent letters of the above research project and confirms that it complies with the approved Ethical Research Standards of the Rand Afrikaans University. Permission was granted for research to continue on Monday, 20 September 2004.

The researcher demonstrated his/her intent to comply with the approved Ethical Research Standards during conduct of the research project.

Recommendations were made by the committee which will be conveyed to you and, if complied with, will improve the quality of your proposal.

Yours sincerely

Marie Poggenpoel
MARIE POGGENPOEL (PROF)
CHAIRPERSON: FACULTY'S COMMITTEE FOR ACADEMIC ETHICS

ANNEXURE B
LETTER TO PARTICIPANTS

10826 Letwaba Street
DAVEYTON
1520
2010-12-02

TO: THE PARTICIPANT

Dear Participant

I am a student enrolled with the University of Johannesburg and writing a thesis towards a doctoral degree under the guidance and supervision of Prof. MM Chabeli. You are hereby invited to participate in a focus group interview for a research study titled: The development, implementation and evaluation of a programme to facilitate critical thinking in nursing education. The research is undertaken to fulfill the requirements for a doctoral degree.

Your willingness to participate in the research will be appreciated, however, participation is voluntary and you may terminate it at any time during the study without fear of prejudice or intimidation. There are no inherent risks to this study, instead the nursing profession will benefit from your participation. The information collected during the focus group interview will be kept in confidence and your anonymity and privacy will be maintained throughout the study. Should there be any threat to confidentiality, anonymity and privacy all data will be destroyed.

The findings of the study will be made available to you on request after the completion of the study. Should you have any further questions for clarity you may contact me at the following number, Agnes 061 816 1122 or 011 424 1892.

Thank you

Yours sincerely

MS. A. MAKHENE

D.CUR STUDENT

ANNEXURE C

CONSENT AND ADDITIONAL PERMISSION TO USE AN AUDIO TAPE

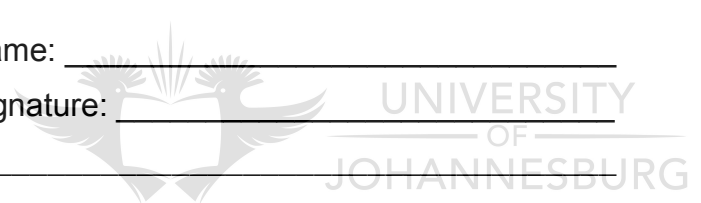
CONSENT TO PARTICIPATE

I _____ have been fully informed as to the purpose and method of the study entitled “Development, implementation and evaluation of a programme to facilitate critical thinking in nursing education”. I understand that my participation is voluntary and that I may terminate my participation at any time of the study without fear of prejudice or intimidation. I understand that if I have questions at any time, they will be answered by the researcher. I hereby freely give consent to participate in this research study.

Participant’s name: _____

Participant’s signature: _____

Date: _____



CONSENT TO THE USE OF AN AUDIO TAPE RECORDER

I _____ have been fully informed as to the purpose and method of the study entitled, “Development, implementation and evaluation of a programme to facilitate critical thinking in nursing education”. I hereby freely give my consent to the use of an audio tape recorder during data collection.

Participant’s name: _____

Participant’s signature: _____

Date: _____

ANNEXURE D

VERBATIM TRANSCRIPTION OF THE PERCEPTIONS OF NURSE EDUCATORS ON HOW THE CRITICAL THINKING FRAMEWORK CAN BE USED TO FACILITATE CRITICAL THINKING IN NURSING EDUCATION

KEY: RESEARCHER = R

NURSE EDUCATOR: NE

CONTEXT

R: How can the framework of critical thinking be used to facilitate critical thinking in nursing education? The framework consists of the context, conceptual, methodological, evidential and criteriological dimensions.

NE: Legislative frameworks that impact on nursing education are part of the contextual considerations. We cannot teach outside what legislation requires. The guiding pieces of legislation that forms the context of nursing education and the facilitation of critical thinking are for example the Nursing Act, Regulation R425 among others.

R: Are there any other legislative frameworks that also form part of the context of nursing education.

NE: Yes we must also look at what is stipulated by the South African Qualifications Act and the National Qualifications Framework". The legislation guiding nursing education stipulates that it is envisaged that the product of a nursing programme will be a critically thinking practitioner who will be able to use these skills in practice.

R: What are the prescripts of these legal frameworks?

NE: Everything that is taught should be in line with the legislative prescripts, what the countries health needs are and practice requirements.

R: Mmm.....

NE: The South African Nursing Council requires that on completion the nursing graduates must be able to take responsibility and accountability for their practice, but such practitioners are those that have critical thinking skills which means the context must be such that it is conducive for the learners to develop such thinking.

R: What are the contextual requirements on the part of the nurse educator?

NE: The nurse educator need to create contextual opportunities that calls on the learners to apply their clinical knowledge using their facilitated critical thinking skills.

R: Do you have any recommendation on how the nurse educator can create such opportunities?

NE: Such opportunities are created through for instance giving the learner an opportunity to solve complex problems that will force them to use critical thinking to solve such problems.

R: Mmm.....



NE: The National Qualifications Framework stipulates that teaching and learning should be at a level that will enable the learners to think critically. According to SAQA the educator should create a learning environment that is conducive to the use of critical thinking to solve problems and application of their knowledge.

R: Are there any more recommendations on how the context should be?

NE: According to R425 the learning context should be such that it enables the learners to apply their critical thinking within their interaction with the multi-disciplinary health team.

R: Mmm.....

NE: Yes and again the context need to be such that the focus is on the learner and not on the educator.

R: Do you think the philosophy forms an important part of the context?

NE: Yes definitely, for instance the philosophy of this institution is “learning to be” and not learning about, because if you are learning about, you rote learn and there is no critical thinking in rote learning (smiling).

R: Does nurse educator’s personal philosophy have an impact in the learning environment?

NE: The educator’s individual philosophy of teaching is also important because I will not be able to facilitate critical thinking if I do not believe in this kind of thinking.

R: Mmmm.....(Nodding)

NE: It is also important that the philosophical framework that forms a foundation for the learning programme be such that it will allow for an environment that will enable the facilitation of critical thinking, for example a philosophy that allow learners to construct their own knowledge.

NE: Yes even the South African Nursing Council philosophy is that the graduates of a nursing programme should be critical thinkers who will be efficient and effective in practice.

R: I see.

NE: A constructivistic philosophy is an example of a philosophy that is supportive of the development of critical thinking.

R: I hear what you say (assuring).

NE: If the learners are to develop critical thinking skills the educator should create a classroom environment that allows them to create their own knowledge, because we cannot assume that they don’t have knowledge when they come into nursing. They come with a wealth of knowledge both from personal and work experience.

R: How do you think the nurse educator should be like?

NE: My attitude should be one of openness in order to allow for the learners to think critically. The learners should be allowed to voice their ideas and I should not shut them down.

R: Mmm.....

NE: Yes the learners must also be encouraged to maintain an attitude of openness as well and allow fellow learners to question and argue out their ideas.

R: How should the nurse educator respond to learner questioning?

NE: Some learners can put you in a corner by asking challenging questions, so as an educator you should maintain an attitude of open-mindedness and not be afraid of challenge (excitedly).

R: Mmm....I see.



NE: Actually in my class I encourage the learners to challenge what I say and challenge each other without the fear of victimization or reprimand”, added another educator in agreement

R: What is the importance of open-mindedness in a critical thinking context?

NE: Open-mindedness is important because it allows me to create an environment where my relationship with the learners is that of partnership which helps with the facilitation of their critical thinking.

R: How does partnering with the learners enhance the facilitation of their critical thinking?

NE: When the learners are treated as partners they take ownership and responsibility for their learning and where relationships are open critical thinking is possible.

R: What other benefits does an environment where open-mindedness is exercised yield?

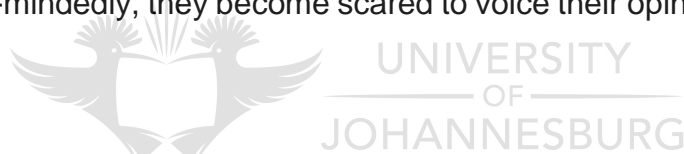
NE: In my class I know that I don't have all the knowledge and I acknowledge the fact that I can learn from my learners therefore I always maintain an open-mind and create opportunities for them to voice their experiences and what they know.

R: Yes, what is the benefit of that?

NE: The educator must be open to learn from the learners. Being open to learning from the learners allows the classroom context to be one where the educator and the learners feel at ease to make mistakes and explore different kind of learning and strategies without being made to feel inadequate and stupid.

R: I hear you.

NE: An environment where the learner knows that their inputs will not be taken seriously and treated fair-mindedly, they become scared to voice their opinions and that stifles their critical thinking.



R: Are there any other benefits?

NE: A learning area where the learners are treated fairly as important participants in the teaching/learning transaction, they freely engage in deliberations without fear of prejudice or bias. I always encourage the learners to freely engage in the discussion because in an environment where there is sensitivity towards the opinions of others the facilitation of critical thinking is possible.

R: What about listening, does it influence the development of critical thinking skills in any way?

NE: As the educator you have to display an attitude of willingness to listen to the learners, be willing to engage them and not to shut them down. The educator should acknowledge the fact that they don't know everything, therefore they must listen to the learners.

R: Mmm.....

NE: The learners need to be encouraged to listen to one another as well because listening allows for the critical thinker to engage with information and think carefully about it.

R: Yes... and?

NE: The learners' point of view and opinion cannot be seen as irrelevant and unimportant; therefore I maintain an attitude of willingness to listen to them. It cannot be a matter of I speak and the learners listen because that will prevent them from thinking critically.

R: What do you think the benefits are?

NE: Of course, if the learners see that the educator is willing to listen to their opinions they also learn to be willing to listen to others.

R: Are there other benefits?

NE: I have learned over the years of teaching that in a teaching-learning environment where the educator listens to the learners the learners also adopt an attitude of willingness to listen to others.

R: How will an unwillingness to listen impact on critical thinking?

NE: An unwillingness to listen prevents active participation and stifles critical thinking. In my years of teaching I have learned that where listening is not the norm, people tend to jump to conclusions and there is usually no critical thinking in such an environment.

R: Have you thought about creativity in the learning environment?

NE: The educator should allow freedom for creativity. The learners need to be made aware that they can voice their ideas, and should be made to feel free to be as creative as they can be without fear of being judged, ridiculed or humiliated.

R: I see (nodding).

NE: In the learning area my learners are allowed to use their creativity to direct their learning.

NE: Yes one cannot expect that they will think critically if you don't allow for the use of their creativity in the learning area.

R: What do you think the effect would be on their critical thinking if they are not allowed to use their creativity?

NE: An environment where the learners are “shut down” when they try to use their creativity prevents them from thinking critically.

R: Mmm.....(nodding)

NE: I usually encourage my learners to actively question issues in class and encourage their independent engagement with the learning task while they individually create their own meaning through the use of their creativity.

R: Yes...I hear you

NE: I also think it is important to let the learners to use their creativity to “figure out” ideas during interaction with others and come up with conclusions formulated through their own independent thinking that is not influenced by what is going on around them”

R: Do you think it is important to that there is trust between the educator and the learners?

NE: Where there is trust the learners will feel free to engage in discussions, arguments and sharing ideas without fear of being judged. They will know that it is “ok” to make mistakes”.

NE: I agree that an environment where there is trust the learners understand that they can challenge their own thinking and that of others with teacher included without fear of victimization.

R: Why else is it important to have a trust relationship in the learning environment?

NE: It is important that the educator creates an environment of mutual trust in the classroom so that the learners can trust their reasoning and thinking to participate actively in the learning area and construct their own knowledge as their critical thinking skills are facilitated.

R: What can be the flipside of not having trust in the learning environment?

NE: A learning environment where there is no trust the learners are afraid of being vocal, thereby suppressing their critical thinking”, added another.

R: Mmmm.

NE: I always ensure that all learners have an opportunity to voice their opinion, including the quiet one. An environment where the learners are not encouraged to trust their own opinions and that of others prevents the learners from thinking critically.

R: Is curiosity a necessity in a critical thinking learning environment?

NE: Yes it is important that the learning environment creates an eagerness to learn on the part of the learners. They need to have passion for wanting to know more and have a probing mind of wanting to go deeper into the information at hand.

R: Is it important to allow the learners to satisfy their curiosity?

NE: It is important that they are allowed freedom to satisfy their curiosity in the learning area without fear that they will be shut down or with the educator showing irritation.

R: Mmm.....

NE: An environment that encourages the curiosity of the learner is one needed for the facilitation of critical thinking, which is the reason why I always ensure that the learners' eagerness to want to know more is maintain by giving them thought-provoking tasks.

R: I understand (nodding)

NE: I believe the learners should be given challenge-filled task that will force them to dig deeper into issues and encourage their inquisitiveness, because critical thinkers are curious, they always want to know more.

R: What do you think the benefits of encouraging curiosity in the learning environment/

NE: A learning area where curiosity is encouraged and promoted the learners tend to be deep holistic learners and with deep holistic learning you get critical thinking being facilitated.

R: And?

NE: Yes superficial learners are not curious and will not think critically in return, but it is the educator's responsibility to awaken the learner's curiosity by creating an environment that is conducive and through the learning material.

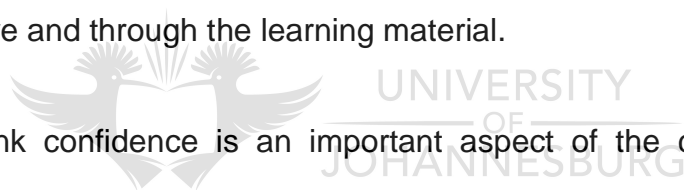
R: Do you think confidence is an important aspect of the critical thinking learning environment?

NE: I think so. The educator has a responsibility of ensuring that the learners' confidence is enhanced because if they are confident they tend to interact openly and freely with an understanding that they too may be wrong and are usually free to reconsider their stance in an argument.

R: What is the other benefit of confidence in critical thinking?

NE: Confidence helps the learner not to shy away from robust debate in the learning area while keeping in check their own thinking patterns.

R: Mmm.....



NE: It is important that the learning environment is conducive to the building up of the learner's self-confidence. I believe that a self-confident learner has a tendency to think critically because they are not afraid to differ with everybody else.

R: I see.

NE: Yes a learner who is self-confidence believes in their thinking capabilities and that of others.

R: Do you think there are disadvantages where learners lack self-confidence?

NE: Yes there are, a learning area where the learners' confidence is not enhanced, you will find that those learners' critical thinking is stifled and they are usually scared to say what their point of view is because of their lack of self-confidence.

R: Would you agree that integrity is another important factor necessary in an environment conducive for the facilitation of critical thinking?

NE: Integrity is necessary in that an environment where one knows that the person they interact with is consistent in their behaviour and thinking an environment conducive for critical thinking is enhanced.

R: Mmm.....(nodding)

NE: Yes I agree with madam number one because one cannot be seen to be changing their stance all the time, therefore it is essential to have integrity if we are to facilitate critical thinking.

R: I hear you.

NE: The educator should also be seen to be a person of integrity. They cannot be seen to say something and do something different, including their thinking. What I mean is that their interaction needs to be one that enhances the integrity of the learners as well.

NE: It is true they have to maintain integrity in their thinking without being easily swayed and convinced otherwise.

R: Thank you for those insights on the context. Now how do you think the conceptual dimension can be used to facilitate critical thinking in nursing education?

NE: The learners have to be able to define concepts of a particular content before you teach them the actual content. Take for instance in my domain, that is intensive care, say I am going to teach cardiology, they must be able to understand and internalize concepts such as tachycardia, arrhythmias, bradycardia, dyspnoea etcetera, otherwise they won't be able to understand what I am going to teach with regard to cardiology.

R: So knowledge of concepts is important for critical thinking?

NE: Yes they will use these concepts to reason out issues about a patient with a cardiac condition but if the educator does not ensure that the learners have this conceptual knowledge it will be difficult to facilitate their critical thinking during presentation of the content.

R: Mmm....I see.



NE: It is also important that during the facilitation of their critical thinking the educator introduce them to critical thinking concepts like critically analyzing, explaining, comparison, evaluation and so on because the application of this critical thinking vocabulary will help them to think critically.

R: Do you mean the learners must also know the vocabulary for critical thinking?

NE: Yes (pause) when the learners understand and have internalized the relevant concepts, they will then use these concepts to argue out and interpret what they observe from patients. Take for instance a learner observes that a patient is cyanotic, they have a tachycardia and the oxygen saturation is low. This learner will be able to bring all these concepts together to think critically about them, by analyzing, and looking at their relationship to each other, interpret and explain how they come about and justify their claims according to what they see. All of this involves critical thinking.

R: I hear you (nodding)

NE: Conceptual aspects could also include concrete concepts and abstract concepts. These conceptual considerations could be verbal concepts which include classes of ideas or objects, or non-verbal concepts that the learners use to make a mental picture to represent the patient's symptoms as they see them and to do this they use conceptual knowledge stored in their memory. During the facilitation of their critical thinking the concepts stored in their minds can also help them to describe a process as they assess the relationship between the concepts that describes a process for an example the physiology of respiration, therefore it is important that during teaching I use methods that will make the learners use these concepts to think, if I want them to think critically. Conceptual knowledge on the part of the learners will also help me enable them to link whatever prior knowledge they have to the new and construct knowledge for themselves through the use of their facilitated critical thinking.

R: Are you saying it important that the learners also have some prior knowledge that they can use to build new knowledge?

NE: Yes, the educator needs to use strategies that will enable the learner to draw from their conceptual knowledge to connect their prior knowledge and experience that they may have gathered in the clinical setting to reason about the content at hand using their critical thinking skills. This will also enable them to identify new relations in the knowledge they are constructing and to create new relations which they may consider relevant to personal learning. It will increase the learners insight into the concepts dealt with, relations, increasing their understanding with the subject matter and influence the creation of meaningful knowledge of the content. (Pause) If the strategy used by the educator is appropriate the learners will be able to interpret information as they discover it, procedures and knowledge references that are related to the concepts under consideration. Finally the learner through encouragement from the educator they adapt the patient clinical picture to their own conception using their facilitated critical thinking skills.

R: Do you think language is also important in critical thinking and construction of knowledge?

NE: I teach a diverse group of learners from different language backgrounds. We normally say black learners are the ones that struggle with English as they are not first language speakers and therefore tend to rote learn, but I have found that this also applies to my Afrikaans speaking learners. These learners instead of thinking critically about what you are teaching they spend time trying to translate what you say into their languages and end up getting frustrated, and to get through the work they just rote learn the work and regurgitate it during tests and exams. So what I do with my “baby learners” (laughs) I speak at their level, I call it my “Zulu English” (laughs again). It is not Zulu per se, but it is simplified English that will allow them to think critically rather than spending time on translation. It is different with my post basic learners, the language I use with them is more advanced as they bring experience from the workplace into the learning area, and because they have been exposed to the language of thinking and nursing vocabulary before, for instance during their basic training, I normally use language that will force them to think right away, in order to get their critical thinking facilitated.

R: So language is important in critical thinking?

NE: Yes (pauses) it is also important that the educator ensures that the learners have an understanding of the nursing vocabulary, so that when I use the language used in the profession the learners understand and they can draw from the relevant conceptual knowledge that is used in the branch of the profession to critically reason out issues and respond in a language understood in the profession. Without the understanding of the nursing vocabulary it might just be difficult to facilitate the learners’ critical thinking because they will not understand the language I am using in the learning area.

R: Mmm....(smiling)

NE: I agree with madam number four, through language the learners learn different concepts that they will use to make inferences about patient experiences they may face in the clinical setting.

R: Yes...and?

NE: Language is a tool of thought and is central to the facilitation of critical thinking. Therefore the educator should acknowledge its value and built on the different language

backgrounds the learners bring to class. The learners should be allowed to express themselves for better understanding some aspects of the learning material in their language, which is why I sometimes if a need arises explain things in the learner's language so as to get them to engage with the subject matter using their critical thinking skills better. I do this in group work and I have since discovered that the learners tend to think critically if you do this. It is therefore important that while we want to cover content and at the same time facilitate critical thinking, we should also appreciate and accommodate language diversities as educators.

R: How important is learner-talk in the facilitation of critical thinking in the learning environment

NE: I try and use a lot of group work in my class so as to improve language proficiency among my learners, and ask questions that stimulate thinking. So you will find that there is a lot of talking in my class, in that way the learners' critical thinking is facilitated.

R: Mmm.....

NE: It is important that the methods we use in the classroom help the learner to use language to make mental pictures of what they are thinking of and explain their feelings and experiences which will enhance their critical thinking skills. The learning activities should be such that they use language to form ideas, shape and influence their critical thinking.

R: Would you say foundational knowledge is important in the facilitation of critical thinking?

NE: For me it is important that my learners have the groundwork in place. By groundwork I mean foundational knowledge. For example if we are to do cardiology, I have to first establish if the learners have the foundational knowledge of anatomy and physiology in place? If they have not covered the foundational knowledge it will be difficult for them to have a frame of reference that they can use as a basis for constructing new knowledge and practically apply it not only to theory but also to practice. This forces the learners to think critically about the learning task and its application to practice.

R: I hear you.

NE: I think it will be difficult for the learners to think critically about the subject if they don't have a frame of reference to refer to while thinking. This frame of reference is formed by the foundational knowledge such as anatomy and physiology. So it is important that I ensure they have the foundation before I deal with the more difficult stuff, for instance before I bring in patho-physiology. This knowledge will serve as an enabler for the educator to facilitate the learners' critical thinking.

R: Mmm.....

NE: This foundational knowledge serves as a 'springboard' from which they pull out concepts that they use to analyse, apply and make sense of what is being taught, for instance in my pharmacology class the learners must have the foundational knowledge of physiology before I teach them about the effect of different drugs. They use this knowledge of normal physiology to reason out the effect of drug to correct the abnormal physiology. Therefore I normally make sure that I use teaching methods that will require them to go back to the foundational knowledge to construct new knowledge for themselves using critical thinking skills.

R: How important is experience in the facilitation of critical thinking?

NE: With me I find that using experiential learning helps the learners to think critically. Exposing them to a particular clinical experience also helps them to have a knowledge base to draw from when they come across a similar case in the clinical area in future. So what I do is use experiential learning and a lot of practical examples in studying a case, where they see the patient with a particular disease and in the process of conceptualizing the disease process, they present the case in class and in the process I ask questions that force them to think critically.

Silence.....

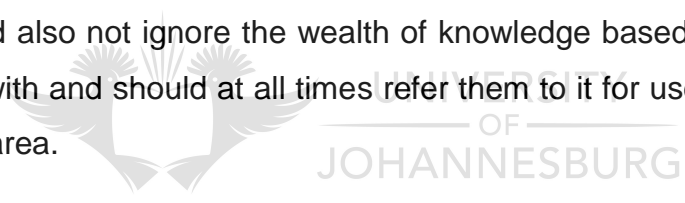
NE: Yes experience gives them an opportunity to conceptualise events and ideas about the patient using logic to understand health problems.

R: Yes.....?

NE: Through experience in the clinical setting the learners also learn concepts that they later use as a frame of reference when reasoning out patient issues. For instance they will learn and internalize concepts such as pyrexia, tachycardia, dyspnoea. Not only do they learn these concepts but they experience them as they see the manifestations on the patients that are under their care.

R: So experience enhances critical thinking as well as formation of conceptual knowledge?

NE: The experience the learners are exposed to in the learning area must be such that it affords them an experience of the real world so that they can form from it a conceptual framework that they will use in future when there is need to make a reference. The educator should also not ignore the wealth of knowledge based on experience that the learners bring with and should at all times refer them to it for use as they argue matters in the learning area.



INTERDISCIPLINARY KNOWLEDGE

NE: If you look at my domain which is intensive care nursing, it is not a pure a science, so you find that during the process of solving a clinical problem the learners will draw from other sciences to try and understand the patient's condition, to interpret symptoms or findings for example blood gas analysis or an electrocardiogram or even to justify their actions in trying to solve a patient's health problem. They use their knowledge of physiology, physical sciences, medical science etcetera to analyse, interpret and explain findings.

R: Mmmm.....(nodding) is there anything else with regard to interdisciplinary knowledge?

NE: I have since discovered that if I repeatedly expose my learners to interdisciplinary knowledge, they tend to learn to think critically. I model the interdisciplinary referencing as I think aloud about the subject matter, and through seeing me think in this fashion they

understand and see live the use of knowledge from other sciences to deal with patients' health problems. They also learn to integrate their thinking within different domains and not think in silos.

R: So you say it helps the learners to use their critical thinking skills to build new knowledge?

NE: Through the use of interdisciplinary knowledge the learners are able to make meaningful connections within the variety of sciences that we borrow from in nursing and this process involves critical thinking.

R: I hear what you say.

NE: I normally make sure that the methods I use to teach forces them to draw from other science, for example I will give them a multidimensional clinical problem to solve which will force them to integrate their insights from more than one discipline so as to demonstrate their understanding of the subject matter. What I want to see is how they integrate concepts, information from different disciplines to solve problems, for example I could say they should assess and formulate a nursing diagnosis for patient who presents with dyspnoea, tachycardia, oxygen saturation of 80% and cyanosis and give justification for their findings. As you know the learner will have to consider anatomy, physiology, physical sciences, psychology and so on to explain some of the symptoms and justifying their thinking and actions.

R: Does it mean the interdisciplinary knowledge forms a frame of reference during critical thinking?

NE: Yes (nodding head), the teaching method must be one that will also make the learners to use interdisciplinary knowledge and methods that allows them to assess the acceptability of the knowledge in problem-solving and clinical decision-making using critical thinking skills.

NE: It is important that as an educator I use teaching strategies that also allow me to integrate new information from other disciplines so that there is ongoing construction of new knowledge by the learners.

R: From what you are saying it is also important that the teaching strategies are facilitative of critical thinking?

NE: The use of interdisciplinary knowledge is facilitative of critical thinking because it helps the learners to develop insight into the subject matter and problem solving skills. I allow the learners to understand “what is” and the framework through which they arrive at the “what is.”

R: Mmm.....

NE: The use of interdisciplinary knowledge in the facilitation of critical thinking assist the learner to acquire the capacity to understand multiple viewpoints on a given topic. The learner gets to appreciate the differences between disciplines on how to approach a problem and the discipline specific rules regarding the evidence they have. This leads to a broader understanding of the issue under investigation.

METHODOLOGICAL DIMENSION



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R: What methodologies can we use to facilitate the learners’ critical thinking skills?

NE: I use a lot of problem solving activities to get my learners thinking critically. I would give a case scenario where they will first identify the problem, collect information about the problem, analyse the information, interpret what they see to be the cause, and plan on how they are going to solve it. Through the use of their facilitated thinking skills they are encourage to continuously judge whether they are in line and give reasons for their actions. For instance I will say a patient presents with difficulty in breathing, cyanosis and tachypnoea and ask them to work through these symptoms to identify the actual problem. So they would need to analyse each symptoms to get down to the bottom of things in trying to understand the symptoms for them to make sense on how it comes about, and do the same with the others until they synthesise all the information they put together to lead them to the identification of the problem.

R: So problem-solving can be one of the methodologies that can be used to facilitate critical thinking?

NE: Yes, I agree with madam number one that the process of problem solving is facilitative of critical thinking. So if in your teaching you take the learners through the process of problem solving, they get to learn the critical thinking skills like analysis, interpretation, synthesising, evaluation and so on. This will also help them to learn that in the process of thinking critically one may come up with a number of solutions and in the process they will also be required to weigh the solutions in their minds and pick out the most appropriate and to do this they need to think critically. So it is important that we use teaching strategies that involve problem solving activities such as problem based learning and case studies.

R: I see...

NE: Here we teach adult learners and we know they have a lot of experience and prior knowledge, so giving them problem solving activities facilitates their critical thinking in that they draw from their experience and prior knowledge as they work through the problems to get to a solution. They analyse the problem and apply their knowledge to come up with a solution.

R: What other strategies can we use?

NE: What I do is that I give the learners a problem to solve and ensure that they come up with several alternatives to choose from to solve the problem. I ask them to analyze and evaluate the alternatives they generated during the problem solving process. With probing questions I steer them towards classifying these alternatives according to priority, for example if they have assessed a patient with a respiratory condition and have identified difficulty in breathing, cyanosis, pyrexia, cough etcetera, they may make a clinical decision that they need to clear the airway, improve the breathing pattern, bring the temperature down and manage the cough. So to trigger a discussion I will ask a question where they will debate and argue about the data at hand as well as analyse each solution and decide which problem to address first, for instance they may decide to address the difficulty in breathing as a priority before bringing the temperature down.

NE: Yes the use of problem solving and decision making processes forces the learner to identify the problem, and consider the data at their disposal. They will then evaluate their

evidence using appropriate criteria and conceptual knowledge to make sense of it and draw conclusions. As they make meaning of the information, I ask questions that will compel them to consider the alternatives, clarify and justify the reasoning behind their choice intervention and reasons to support their decision.

R: So decision-making can be used as another methodology to facilitate critical thinking?

NE: I also use debate to get the learners to think critically in the learning area. Like for instance when they debate issues they are forced to think things through before they present their opinions on the topic. I find that this also gives me and their classmates the opportunity to question the learner about the thinking that went into their opinion formation and in that way they get to think about their thinking skills and evaluate them before giving their explanation in justifying what they say. Through debate the learners communicate with others and they are enabled to engage in in-depth analysis of the problem while simultaneously comparing their point of view with that of others and I believe this backwards and forwards consideration of the issue at hand forces the learners to think critically.



R: Ok (nodding), we also use debate?

NE: I usually give the learners a controversial topic to debate on in their groups. They work on the topic and come back and present in class, while the ones in the audience are asked to judge and evaluate what they say. They will then ask questions based on what was said. In the process the learners learn to avoid making claims without justification, so they will make sure that they need to use their knowledge to support what they say and learn to listen carefully to the opinions of others, evaluate them before they present their opinions' which is part of critical thinking.

NE: Yes I agree with you when you use debate their reading comprehension, argument, evaluation of evidence, and summarizing skills are enhanced and thus the development of critical thinking skills. Alternatively the learners may be asked to prepare a logical argument on a particular topic, and I would encourage the other learners to listen actively to the different perspectives, differentiate between subjective and objective information and formulate their own opinion based on evidence.

R: Argumentation is another methodology, is that what you are saying?

NE: Yes that is correct, another example is that the learners can be given a treatment regime to debate about and defend. The learners are then asked to assess cost and benefit issues and make a decision. They can also use debate to outline their reasons for taking a certain position. In the process they do not only have their critical thinking skills facilitated, but also use language to present their views, support fellow learners' views, disagree and present an alternative view.

NE: It is also important that as an educator I encourage the learners to treat each other with respect during the debate and eliminate competition and accept the opinions of others. The use of debate in the learning area gives the learners besides facilitating their critical thinking skills, an opportunity to use cognitive skills of analysing, logical reasoning, discriminating, predicting and transforming knowledge. It also promotes self-confidence which one of the dispositions for critical thinking.

NE: The use of argumentation is another method that I encourage in the learning area to get the learners thinking critically as it ties in well with debate. For instance during the process of argumentation the learner is compelled to search for evidence be it from their prior knowledge, experience or literature to support their arguments. It also gives the fellow learners an opportunity to assess their colleague's think and challenge areas where they identify flaws, while at the same time assessing their own as they also get challenged. In that way they learn not to take things for granted but to understand the point of view of others and evaluate them against their own while arguing for acceptance or rejection of their standpoint.

R: Am I correct to say what you are saying is that it is important to support claims with evidence?

NE: I encourage my learners to argue things out using evidence-based information. So I normally send them to go and research and come back and present their arguments to their fellow learners, while using evidence-based justification to back these arguments.

NE: The use of argumentation is important in the facilitation of the learners' critical thinking, for instance in my class I would give the learners a case study where there is

transgression of legislation with regard to medicines and a group of learners are assigned to go and study the legislation that impacts on prescribing and dispensing of medication and the one group act as judges while the other group will argue out what happened and provide evidence to support their arguments.

R: Mmm.....

NE: Experience plays an important part in the facilitation of critical thinking. It is important that the educators should not forget that the learners bring a wealth of experience into the classroom. So when I teach I always encourage them to refer to their clinical experience to reason out what is being discussed. So you will find that as they share their experiences I use them to start a discussion. They will debate while at the same time using their clinical experiences as a frame of reference to justify their arguments. I find this to be facilitative of their critical thinking skills because they critically analyse, explain and evaluate what others are saying as well their own responses.

NE: Through argument the learners examine, interpret and defend their standpoints while at the same time reflecting on their views and those of fellow learners; however the important thing is that the educator should ask relevant questions so as to take them through the process of thinking critically. Through their facilitated critical thinking the learners learn to listen to both sides of the story and eliminate narrow-mindedness.

R: So they must be open-minded in order to thinking critically?

NE: Yes, critical thinking involves logical thinking, so it is important that as we teach we encourage logical thinking. In my instruction to the learners I use words like “deduce from the scenario” to get them to use deductive reasoning. Even the way I formulate case scenarios for them, I put them in such a way that the learner can work deductively maybe from the signs and symptoms that I have given to them to get to a diagnosis of a health problem.

NE: Yes I also do that with my PHC learners whereby when I teach history collection, they will work from a number of signs and symptoms described by the patients, and

compare and contrast those with what they observe through objective measures. From there they analyse all the data they have collected and reason deductively from it to get to a conclusion which is usually a diagnosis.

R: I see.

NE: To enhance the use of deductive reasoning as one of the methods that facilitate critical thinking I for example give a statement from which the learners are directed to reason deductively by generating ideas and assumptions to get to a conclusion that can either support or refute the statement. They will then use the process of deductive reasoning to apply the statement to a number of problems to prove its applicability.

NE: An example could be asking the learners to work from a particular diagnostic statement, for example – “patient has cyanosis due to bronchospams” and then they are asked to work deductively to prove or disprove this statement.

NE: (agreeing) Another example could be asking the learners to work from a particular diagnostic statement, for example – “patient has cyanosis due to bronchospams” and then they are asked to work deductively to prove or disprove this statement.

R: So you are saying deductive reasoning is also important as a methodology that facilitate critical thinking?

NE: I also tend to use a lot of inquiry-based and discovery learning to get them to think inductively. I would give them a case scenario that requires the learners to come up with knowledge that has not been covered, ask a question to get to a solution while requiring them to search for information, data that needs to be analysed or a hypothesis that must be tested as an example.

NE: The use of inductive reasoning helps the learners to get into a habit of working logically through the learning task without jumping to conclusion. It provides them with new ideas which help expand their knowledge. It allows them to search for patterns in arguments and draw conclusions based on those patterns. The learners get moved from

specific details and observations about patients to more general underlying principles or processes that explain the particular observations. It allows for open-ended exploration which is in line with critical thinking. I use inductive reasoning to let them discover new information for themselves.

R: Mmm.....

NE: Deductive reasoning on the other hand is narrow in nature. I use it when I want the learners to confirm a theory. I start first by giving the learners a body of general information with certain clues and ask them to deduce answers to certain question and to get to the answers they are compelled to use thinking skills such as analysis, interpretation, drawing inferences and so on.

NE: It is important that there is collaboration and cooperation among learners if we aim to facilitate their critical thinking. So I use a lot of collaborative and cooperative strategies to get them to work and think together. For instance I use group work which I find to enhance their collaboration and cooperation, because the learners learn to empathize with each other's and also learn to be sensitive to the point of view of others. They also learn to really listen to others and learn to understand that it is not only their views that matter but also get into a habit of assessing their own thinking and get into a habit of compromising.

R: I hear what you say, so collaborative and cooperative learning also facilitate critical thinking?

NE: Collaboration and cooperation provides an opportunity for interaction among the learners because the discussion and sharing of ideas that goes on between them I have found to stimulate critical thinking, fosters a feeling of togetherness within the group and promotes individual responsibility for learning through group interaction. The learners get involved with the subject matter and participate in the learning activity through their facilitated critical thinking skills.

R: Mmm.....

NE: Furthermore they learn to recognize and appreciate the fact that their own experiences and thoughts are of value when shared collaboratively and cooperatively with others. The learners who are quiet in a classroom setting also get an opportunity to share their views within a group without the threat of a bigger group. Within the group they gain confidence in presenting findings in a group where they feel “safe” to share their views. I have found that through collaboration in the learning area the learners create their own meaning of the content based on group interaction and conversation.

NE: Collaboration facilitates critical thinking in that during a collaborative activity the learners discuss, clarify their own ideas and evaluated those of others. Through collaboration the learners are able to look at a problem from different perspectives and are able to negotiate with fellow learners and make meaning as well as come up with solutions through shared understanding. They get to analyse, interpret and predict”, said another educator.

R: Mmm... that is interesting.

NE: I use group activities to let the learners work collaboratively on a learning task, where they use a joint intellectual effort to achieve an outcome. You will find that through collaboration they share knowledge, personal and clinical experience, language and culture that is built upon in the learning area and there is usually shared authority, co-responsibility and co-ownership of the teaching/learning interaction which is facilitative of critical thinking. I also encourage them to set goals within the content to stimulate their interests to assess what they are learning. During the collaborative activity I also encourage the learners to listen to the diverse opinions of their fellow learners, support their knowledge claims with evidence and use their facilitated critical thinking as they engage in a meaningful dialogue with others. During the collaboration there is also an element of cooperation among the learners.

NE: Cooperative learning as another method that I use to facilitate my learners’ critical thinking skills promotes learner accountability and interaction as the individual learner knows that the group success depends on them as well. The learners learn to challenge ideas, share information and question their own thinking and that of others without fear of alienation. Through cooperative group activities the learners reflective skills are enhanced and they get to through reflection evaluate their behaviour and that of others. However I

have realized that cooperative group learning activities need to be carefully planned by the educator for meaningful learning to take place and the facilitation of the learners' critical thinking skill. The learners also learn to treat each other with respect which is one of the attributes of critical thinking.

R: Mm.....

NE: I think the value I see in using cooperative methods of teaching and learning is that the learners develop a positive interdependence and still maintain individual accountability for their learning. I ensure that the learning area climate is non-threatening. Through cooperative learning the learners get exposed to diverse perspectives and alternatives. They share, exchange ideas, criticize and provide feedback to one another. Their awareness of the learning outcomes and strategies is increased, which to me is an element of meta-cognition, a part of critical thinking. The learners get engaged in active and constructive learning because they talk, listen, read, write and reflect within the group while their critical thinking skills are facilitated. Through cooperative learning they assimilate new information and integrate, interpret it and construct new knowledge.

NE: I encourage my learners to do a lot of reflection on what they know to be, what is and what should be. I always use statements such as 'think back on the time. I have realised that the use of reflective journals give my learners an opportunity to share by writing down about their experiences in the clinical area and come back and share them with other learners. During the presentation they get questioned and this forces them to refer back to their experiences, analyse the events as they happened, draw inferences, explain and justify their actions. During this process they interrogate and internalize the subject matter. Their experiences provide a basis for the facilitation of their critical thinking because they constantly get sent back to them for reference and have to provide justification to support their reasons.

R: So reflection is another methodology?

NE: Yes, during the activities in the learning area I give tasks that require the learners to reflect on their experiences as they reason about patient's health problems and they get steered towards questioning their thinking that went into resolving the problems they were

faced with in the clinical area and attach meaning to the actions involved so as to have a better understanding of their experience.

NE: The learning tasks that I give are such that they encourage the learners to use reflection to analyse and make judgments about the patient. They are also encouraged to consistently reflect on what they know, what they believe, they assess what they know, what they still have to know and how they are going to bridge their knowledge gaps. Like for instance I would give them a scenario that matches an experience they would have come across in the clinical area I will ask them questions like- for an example, I would say- think of a time when you nursed a patient with congestive cardiac failure who after administering digoxin to him the patient presented with a severe bradycardia, reflect on your actions during the administration of the medication, what did you do or not do that could have led to the severe drop in the patient's pulse rate, what was the effect of your action on the patient, on your colleagues who were on duty, what will you do differently next time, what additional knowledge do you think you need that will help you avoid a similar situation in future, how do you plan to acquire such knowledge and so on?

R: I see...



NE: Reflection affords the learners the opportunity to take a step back and retrace the mental steps they took to solve a patient's health problem and how they arrive at the clinical decision they made. As they respond to questions I allow them time to reflect on their answer. The questions I ask are those that require them to give reasons and evidence.

NE: It is also important that the educator provides the learners with guidance through the thinking process as they explore their frames of reference in reflection. Through reflection they learn to apply new knowledge to their existing frames of reference and think abstractly. So to get them to answer the why, how and what specific to clinical decisions they have made I encourage reflection. The educator needs to also ensure that the learning activities stimulates questioning and curiosity which will in turn trigger reflective thinking. So the use of reflective journals as a teaching strategy can help to get them to reflect which will in turn facilitate their critical thinking skills.

R: Mmm....

NE: I have found that the use of reflection in the facilitation of the learners' critical thinking gives meaning to the teaching/learning experience in the learning area and promotes a deep approach to learning. To enhance their reflective skills I usually ask them to reformulate a problem, question their own assumptions, look at a patient health problem from multiple perspective as they analyse it and also identify their knowledge gaps in the process. Through reflection they learn to identify and analyse their assumptions and how they influence their actions and decisions in the clinical area. They also develop a questioning attitude and skills which are necessary for critical thinking.

NE: To get the learners to think critically I also ask them to reflect on the learning experience during the teaching/learning activity and afterwards. During the reflective activity they try to make meaning of the content and meaning making is an important part of the development of critical thinking skills and it also help with the development of sound clinical judgment skills.

R: I understand, a reflective learner is a critically thinking learner/

NE: I have since realized that without reflection the learners become passive participants in the learning area without meaningful learning taking place. Through reflection they learn to make judgments in complex situations. The learners make meaning of the content by reflecting on their experiences. This forms a vital component of learning and the development of critical thinking.

NE: Reflection affords the learners an opportunity to re-evaluate their learning experience and make a decision to do things differently the next time round.

R: Ok.....(nodding)

NE: I normally ask questions with words such explain, compare, why, how did you get to that conclusion. What is the best way to solve this problem and why, do you agree or disagree with this statement?

NE: I agree the questions asked in the learning area should force the learners to evaluate assumptions, viewpoints, consequences and evidence.

R: I hear you mentioning questioning, does that also facilitate critical thinking?

NE: Yes, sometimes I would ask a learner to summarise an answer given by another. To get the learners to think critically I ask questions with multiple answers and allow waiting time to get them thinking.

NE: I also use a lot of thoughtful questioning in my teaching because through questioning I take the learners from the known to the unknown as well as stimulation of debate and argument which are facilitative of critical thinking. It is important that the questions that we ask are such that they stimulate higher order thinking for example evaluation and synthesis. For example I ask questions like, what is the problem here, how did you arrive at the solution, why the choice of solution, how can you do it differently next time?

NE: I try and ensure that the questions I ask the learners probe deeply or explore the meaning, justification or logic behind a claim, position or line of reasoning. The questions are such that they investigate assumptions, viewpoints, consequences and evidence. I use the Socratic method of questioning which focuses on clarification of what is said. Socratic questioning fosters critical thinking, evaluation and knowledge application by the learners. I find that this method of questioning probes beneath the surface of things and pinpoint problematic areas of their thinking processes. It encourages the learner to become their own questioner and develop habits of critical reflection.

R: So Socratic method is also one of the methods that can be used to facilitate critical thinking?

NE: Questioning should activate analysis, comparison and evaluation. “Why” questions which require an explanation of principles, helps determine the amount, direction and quality of the learners’ thinking. The questioning needs to be such that it enables the learners to organize and interpret learning into generalizations through the use of critical thinking. As an educator I formulate questions that facilitates in the learners’ an attitude of critical inquiry. Questioning is one of the most effective teaching strategy and it can include co-operative questioning whereby the questions asked are formulated by the

learners themselves. Co-operative questioning incorporates critical thinking dispositions and skills. The method empowers the learners with questioning skills which is a necessary attribute in critical thinking.

NE: It is also important that the educator looks at the type of questions they ask. For example the questions can be factual, descriptive, clarifying or value seeking. The use of questioning helps to take the learners through a process of deductive and inductive reasoning. They get engaged in a mental effort of searching for answers and develop skills of information seeking, which is characteristic of critical thinking, said one educator. The educator can question for information where the learners will search for information and evaluate the quality of that information or question on assumptions whereby the learners are directed to examining what they take for granted. In questioning of relevance as another example the learner will use the skills of discriminating to evaluate the relevance of the response to the question under discussion. The use of evaluation also aid in the facilitation of critical thinking. Through evaluation the learners judge and assess the worth of the information they have and that which they get from others. I also encourage the learners to continuously evaluate what goes on in the teaching/learning activities as their critical thinking is facilitated. Triggering the use of such a skill is facilitative of critical thinking.

R: Ok I understand.

NE: Questioning is also vital for teaching and learning as it can be used to stimulate interaction between the teacher and learners and challenges the learner to defend their point of view. It is important though that the educator should consider the purpose of each question they pose and then develop the appropriate level and type of question. Questions can be such that they require one or more specific answer or alternatively ask a question requiring a variety of correct answers which forces the learners to use analysis, synthesis and evaluation. I ensure that the questions stimulate a learner-centred discussion thereby encouraging the development of critical thinking through learner talk in the learning area. I also make sure that the questions I ask are short and to the point and I usually rephrase the question and probe for further responses from the learners. It is important that the methods used in the learning area are those that will facilitate critical thinking skills in the learners.

EVIDENTIAL DIMENSION

R: How can the evidential dimension be used to facilitate critical?

NE: I think it is important that the learners get use to looking at the evidence available to them in justifying their claims. Like for instance during a case study I would ask them to go and investigate why a patient with asthma would present with bronchospasm and cyanosis as an example. This will compel them to go and investigate first what bronchospasm is and how does it come about in a patient with asthma. I always emphasise that the information they come up with needs to be scientifically based. This I find it teaches the learners that if you have a claim that you need to consider and there is not enough information then they should investigate to answer the what, why, and how before they make a conclusion.

NE: Investigative skills are part of the critical thinking skills the learners should have. Investigation enables the learners to use critical thinking in the learning process of practice skills to solve clinical problems and in the process respecting the point of view of others. They also get to learn identify areas of investigation, collect evidence, analyse it, present a point of view based on evidence and evaluate the effectiveness of their work”.

R: Mmm....

NE; I also find that sending them to go and investigate a phenomenon helps facilitate their critical thinking skill because during the investigation they formulate reasonable questions about the problem they need to investigate. They will also be able to find the information relevant to the problem at hand and how to access such information. They must also identify and look for additional learning material to use in the investigation.

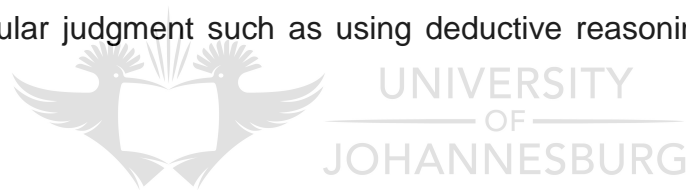
R: Mmm... so investigations is also important?

NE: Investigation also involves for instance a decision made on how to collect objective data on a patient with a health problem, for example they may be having a patient presenting with a cough, difficulty in breathing. They will decide how to get evidential information about the patient and how, where and why they need to gather this evidence for example what diagnostic procedures to follow and why and how to interpret the findings. After investigation and coming up with evidence they will then present to the whole class for their consideration of this evidence.

NE: I have also found that when I question them about the results of their investigation they tend to look for reasoning and justification for their evidence. What I do is give them a clinical problem and request them to go and investigate.

R: Mmmm...

NE: I think it is important that they are guided to search for literature related to the problem. They also need to formulate questions or even answers with outcomes that are related to the health problem. Collaboratively with their co-learners they confirm the information or the results. They will then synthesise the information gathered and report back in the learning area. During the reporting the fellow-learners investigate and evaluate the evidence presented against the context in which its presented to make a judgment, for example if the investigate was about a patient with pneumonia then context used to look at the evidence should be pneumonia or respiratory problems. I also ensure they formulate criteria for making a judgment and that they use the correct methods to form the particular judgment such as using deductive reasoning skills to come to the judgment.



NE: What I do during feedback I would ask questions or ask other learners to ask their fellow-learner questions in relation to the feedback they give. The questions are such that the learner will be forced to explain thinking skills they used to arrive at a judgment, explain their choice of treatment modality for a patient and why and defend their standpoint or view.

R: Does that meaning they also to reason out claim before they come to a judgment?

NE: I have also found that continuously asking for reasons leads to development of the skills of using evidence or counter evidence to justify their claims or results and explain their assumptions.

NE: I sometimes put up a health problem which poses a controversial topic and ask them to argue it out while stating their belief on the subject, for example termination of pregnancy for minor girls. There after I will take them through a process of justification of

their beliefs. I will then ask them to gather and compare evidence from different perspectives like for instance, a sociological, health, legal, biblical perspectives. They will then be asked to weigh the evidence using interpretative considerations of the evidence at hand, outline the explanatory values of their interpretations, choose an alternative avoiding the risk of conclusions and look at the consequences of an alternative judgment and defend their conclusion based on the fact that it represent the most practical understanding of the issue based on the available evidence.

R: So justification is also important?

NE: To get the trail of evidence as the learners present their case studies or projects, first of all I look at how they got to the conclusion. I look at the process they used to gather information. They need to explain or demonstrate where they got the evidence from, how did they go about collecting it, is it relevant or not, can they justify their arguments, how do they back up those arguments using the evidence they have. I look to see if there is logic in the evidence they present.

NE: It is important that they are able to explain the step by step process of how they got to their conclusions, what evidence they used to get to the conclusion, the amount of evidence they bring forth is it complete, is it adequate and do they present it in a clear and understandable manner, are their argument clear and not full of “waffles”. I also use a lot of evidence-based learning to get them to always back their justifications and support their arguments with evidence.

NE: I think if you always ask them to give reasons for their actions, decisions or choice of treatment they get used to regularly recognize patterns in the presented evidence, look for relationships in the data, formulate hypothesis based on the evidence, provide explanations and draw conclusion. In all this there is critical thinking.

R: This sounds very interesting.

NE: I agree with my colleague after collecting clinical data I would instruct the learners to map out the processes they used to collect the data, interpret it and they would also explain how they produced the evidence through a data audit trail. The evidence could

be based on their clinical experience, observation of the patient, particular patient events, comparisons of similar patient events or opinion of experts or authorities”, added another.

NE: I try and ensure that in what the learners are presenting, be it written or verbal there is logical coherence. I would ask questions such as does that make sense, does this follow for instance before you implied this and now you are saying that, how can that be true?

R: Yes...(nodding).

NE: In their clinical arguments, debates and presentation I ask the learners to evaluate the logic in the presented work by tracing a meaningful path or process that establishes an outcome of the health problem under discussion by using the evidence at hand to make a reliable and sound clinical decision.

NE: In as far as clarity is concerned what I normally I ask a lot of clarity seeking questions such, could you elaborate further on that point, could express what you have just said differently, can you give a practical example of what you have said. Establishing clarity is important to assess critical thinking, because if their responses are not clear it becomes difficult to check if what they say is relevant or not, accurate or not. Sometimes I would instruct them to formulate questions related to the issue at hand in their learning groups and then they would have to assess whether any question was left unanswered or whether any detail caused confusion or look for clues such as something that is not making sense in the discussion and ask clarity seeking questions like, ‘could you explain that, please rephrase etcetera”.

NE: Alternatively as they present a case they would be instructed to analyse their reasoning to identify irrelevant or inconsistent thought as they reason about patients’ health problems. I also encourage the learners to get into the habit of thinking about their own thinking to evaluate it for clarity.

R: How should then the criteriological dimension be used to evaluate critical thinking?

NE: The learners also use language to clarify their communication about issues that are significant to nursing.

NE: Yes they need to be taught to learn to say what they mean and mean what they say. Which is why I also encourage them to give concrete and specific examples that are clear.

R: I see.....

NE: It is important that the learners understand that in critical they need to provide and look for complete information in their arguments and those of others. If the information is incomplete it becomes difficult to assess the logic, clarity and breadth and so on of the information at the hand. So to facilitate their critical thinking I would ask them to evaluate the information they have about a patient for completeness and in that way they learn that if the information at hand is incomplete they have to look for more information or evidence before they can make any clinical decisions.

NE; I ensure that the learners through the manner in which I evaluate the information they present must be such that they are able to draw inferences from or draw information they will be able to use to justify their claims, and that they can only do this if the information about a patient situation they are presenting is complete. Regularly taking them through this exercise enables the learners to learn to test for completeness in the information”.

R: So completeness of information is also important in critical thinking?

NE: Yes and I think it is also important to teach the learners that in critical thinking one also evaluates the depth of what the others are saying in order to really get to the bottom of what they are saying. So to evaluate the depth of their arguments or claims I ask questions like, “how does your answer address the significant issues in the question, how are you taking into consideration the problems in the question. I try and bring to their attention that a statement can be clear, logical and relevant but superficial.

NE: What I normally do is to ask the learners questions that probe for relevance in information and arguments they put forward in class. I ask questions like, “of what relevance is that? How is that related to the discussion at hand? Questions of relevance compel the learner to differentiate between relevant and irrelevant information.

NE: We can also give them a case scenario and instruct the learners to look for relevant information that can be used to solve the health problem in the scenario. They are taught to look at thoughts and if they make sense.

R: I understand (nodding).

NE: It is important as well for the learners to see the educator evaluate logical relevance, for example, evaluating if the facts given are logically relevant to the issue at hand for instance if they describe the signs and symptoms of a particular disease, these must be relevant to the described patho-physiology or the health problem under discussion. This facilitates the learners' skills of evaluating for relevance and to arguing for a relevant fact

NE: It is also important to evaluate the breadth of what they say. Like we have already said I also look at the breadth of their arguments and claims. Like I would ask questions like, "do we need to consider another point of view, who has a different view in as far as this is concerned, What would this be like from a point of view of.....? Their line of reasoning may be relevant, clear and deep but lack breadth. They may be arguing from one standpoint which gets deeply into an issue, but only recognize the insights of one side of the issue under discussion. This also facilitates the learners' critical thinking because they also learn to evaluate information and arguments from others for breadth.

R: Is there any other thing that you would like to say? (pause) If not thank you very much for your time and the valuable information that you shared with me.

ANNEXURE E

VERBATIM TRANSCRIPTION OF THE FOCUS GROUP INTERVIEWS OF THE LEARNERS ON HOW THEY EXPERIENCED THE IMPLEMENTED PROGRAMME

KEY

RESEARCHER= R

LEARNER = L

R: Please tell me your experience of the implemented programme.

L: I particularly enjoyed working in a group wherein there were different opinions from my colleagues and I realised that there is no one answer to a question.

R: Mmm....

L: It was fun, interesting and enlightening especially listening to different opinions.

R: What do you mean by interesting and enlightening?

L: Working with others and being encouraged to discuss issues amongst ourselves made think, as people would challenge your thinking and that forced me to evaluate how I thought and how I arrived at conclusion and realise that I may be wrong.

L: I particularly enjoyed working in a group, because you get to listen to others point of view, which forces you to reconsider your own point of view and that helps you to identify mistakes in your thinking (excitedly).

R: How did working in a group facilitate your critical thinking skill?

L: Working with others was interesting and I became aware of different ethical dilemma we might come across in practice and the different decision we might have to take in such situations, thinking about all these things, really stretched my mind.

R: Was it that difficult?

L: Of course it was challenging, I did not know what to do where you had to choose between the doctor and the patient”.

R: Mmm.....(nodding)

L: I was glad we had to give our opinions and they were taken seriously, that made me feel valued and I was prepared to engage in critical thinking (smiling).

R: I can see you enjoyed the lessons.

L: The contributions from others made me see things from a different perspective and I realise that I must always maintain an open mind to the opinions of others.

R: Mmm.....

....

L: I realised that we were thinking from different angles which made the lesson meaningful for me and I enjoyed that.

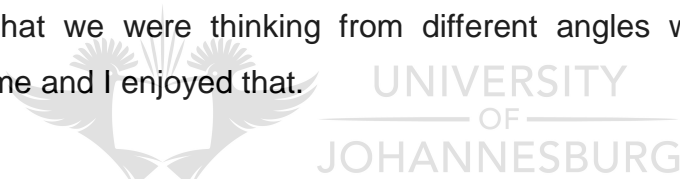
R: What does the others think?

L: It was nice to hear different sides, it made me to think a lot. This was fun. I got to see other people in another level, how they think, if they were open to other people’s ideas and whether they were ready to adapt their ideas.

R: How did you reach the decision?

L: Decision making on an issue was not easy I had to think on how to present my argument in order to see if the others see things the way I do. So to do this I had to come up with a strong justification that is supported by evidence. I think we should be taught like this more often because as you learn your critical thinking skills are also improved (smiling).

R: Mmm.....



L: I realised that you cannot just make a claim without saying the reason why you think that is the issue, when the teacher asked “why” and “where” do you get that from, you at first feel uncomfortable, but I later realised that you are forced to think critically and to justify your claim.

R: Yes.....?

L: I also realised that in critical thinking you don't just make claims without giving evidence, which means it is important to question issues and not to take everything at face value. I learned that a critical thinker is always sceptical and knows that there is always two sides to a story and that one may be wrong in their thinking.

R: How did the arguments help you think?

L: The arguments gave me an opportunity to say what I think, what I believe in and justify why I maintained such a view while my fellow learners were allowed to assess them”.

R: What is your opinion with regard to the methods that were used to teach you?

L: The lessons and methods used to teach made me to look at the “bigger picture” of things, to think out of the box you know”, said one learner. “Ja we were required to go deeper into the issue under discussion and in that, one had to think critically and could not just readily answer”.

R: Mmm....I hear you.

L: “Personally I realised that to solve a problem I have to think carefully and deeply and collect evidence to support my claims which may be wrong, so I had to keep an open mind that should I be required to change my view I do so.

R: Yes how else were you helped to think critically?

L: Yes you were asked to carefully explore and analyse the issue and justify with reasons and evidence.



R: How were you made to feel during the teaching/learning experience?

L: I liked the fact that we were not shut down, each person was given an opportunity to give their opinion and the questions that were asked challenged our thinking and we were forced to think.”

L: The questions that were asked were sometimes difficult and challenging but what I liked is that we were given an opportunity to look for answers either by researching or discussing with our fellow learners (smiling).

R: Did you enjoy the teaching strategies that were used during the facilitation of your critical thinking skill?

L: Yes I liked the debates and arguments because they stimulated our critical thinking and I think we should be given more of this kind of teaching (debate, argument) because it forces us to look for information as I realised that there is no one answer to any question.

R: How did you experience the teaching strategies?

L: Ma’am it was the questions that were challenging, I had to think hard because you kept on ask questions even when you were given an answer, at first I thought but the question has been answered, but later on I realised that there is more than one answer to a question and that I cannot always be right. It was fun.

R: Mmmm.....I like that

L: During the learning activities I had to think critically in order to answer the question that was asked and relate it back to a previous lesson and this made me think deeply and critically on what was involved.

R: Yes....(nodding)

L: For me hearing responses from others made me realise that there are different ways of looking at an issue and this challenged my views and beliefs and it made me to think

more critically. It dawned to me that the more wider the perspective on how I perceive an issue or situation influences and develops my own attitude and beliefs. The arguments influenced my thinking skills and sometimes I had to change my perception.

R: Let's hear your thoughts ma'am ?

L: I learned that I have to make my explanation clear as at times it is hard to understand what others say if it is not said in a clear manner.

R: Did you encounter any difficulties in evaluating the explanations by others for clarity

L: One thing that I found a bit difficult was to evaluate whether the claim is clear, whether it is relevant or if sufficient ground, the relevance of the warrant and whether exceptions have been taken into account in drawing conclusions and whether counterarguments have been presented.

R: Yes.....

L: I enjoyed the way the educator redirected our thinking when we went off at a tangent, without making us feel stupid.

R: How so?

L: Yes I liked the way you responded to our answers Ma'am. You did not make us feel stupid, and everyone's opinion was taken into consideration. Even when we said something irrelevant you brought us back to the topic without ridiculing us. So I felt comfortable in saying what I thought without the fear that I will be made to feel stupid.

R: How did you experience question your own thinking processes and those of others?

L: It is difficult to question your own thought processes and recognise your own assumptions unless you use others as a mirror to reflect things to you, but the activities we were given in class especially the argumentation activities made me to look at issues,

weigh them and come to an understanding where my colleagues are coming from and their different points of view.

R: Mm.....(in agreement)

L: The debates in class helped me to learn new knowledge. I also felt confident in presenting my point of view and it helped me to think critically although it was quite challenging”, remarked one learner.

R: How did you experience the debate?

L: I particularly enjoyed the debates and arguments. I think my critical thinking skills have improved because we had to assess and analyse the arguments of the two teams, engage in research as we all had to research the topic, collect data and question our assumptions and cooperate with others in the team.

R: Mmm....and your critical thinking skills? (smiling)

L: I agree, the debate helped me to understand the topic better, learn new knowledge and my critical thinking skills were enhanced.

L: The debate was interesting(LAUGHS) I initially wanted to fit into one group but I found all arguments very good and forcing me to think, I think we should be given more of debates as it enables us to think critically and to research and read more.

R: Interesting, and.....?

L: The debate activity motivated us to engage in critical reasoning which allowed our fellow learners to generate explanations as well as being sensitive to their own assumptions and those of the other learners.

R: Ok, let's hear from ma'am there.

L: I used to look at issues from one side which is the way I see them. In argument I would make sure that the last word is mine and that I win. In this programme I have come to

realise that it is important to listen to other peoples' opinions and to look at a situation from different perspectives because it is not about who wins the debate.

R: Is there anything more that you learnt?

L: Of course I have learnt that one must always maintain an open mind. The group made me realise that I cannot always be right and I learnt to identify gaps in my knowledge and that I can learn from my mistakes. I also learnt that I cannot be biased when evaluating arguments.

R: I see (nodding).

L: The debate provided us with excellent chances to find various opinions and understand their differences, thus yielding better conclusions.

R: You seem to have enjoyed the debate, but did it help you to think critically?

L: Yes I found that it was good to listen because one had to listen critically and share ideas. There is a sense of achievement to be gained from refuting the ideas of the opposite side in a debate. It is also interesting to consider different perspectives to identify plausible ideas.

R: Mmmm.....

L: Discussing the story was interesting and it improved our critical thinking. It was a meaningful experience where we also learned how to formulate persuasive ideas without the risk of offending others. The group perspective helped me learn how to organize, synthesise and negotiate different ideas.

R: What do you think about working together in groups?

L: Group debate is good because we work together to discuss issues and write responses, unlike previous practice of working individually, peer discussion facilitate effective learning.

R: Yes....?

L: Debate encourages us to listen and to be tolerant of different ideas.

L: Yes I also realised that if you are going to argue you have to be able to listen critically in order to know what other people are saying.

R: Do you think your critical thinking skills were facilitated?

L: For some of us who are shy, working in group motivated us to express ourselves and listen to others, the educator encouraged us to become actively involved in the discussion. All the group members were confident in expressing their ideas, and we learnt to present reasoned arguments. The activities also gave us an opportunity to think deeply and critically.

R: Did you feel involved and welcomed in your learning groups

L: I was initially shy to express my views but when I saw other talking I overcame my nerves and started talking which was not bad at all, as our group began very noisily because we were disorganised but we later started expressing our ideas and almost everyone in the class became involved in the class discussion.

R: Thank you for your time and your participation in the implementation and evaluation of this programme.